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Journal of The Southern Medical Association

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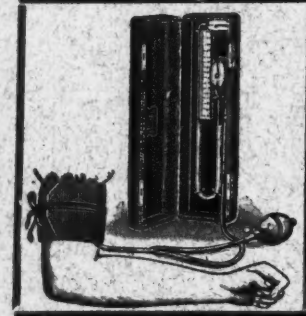

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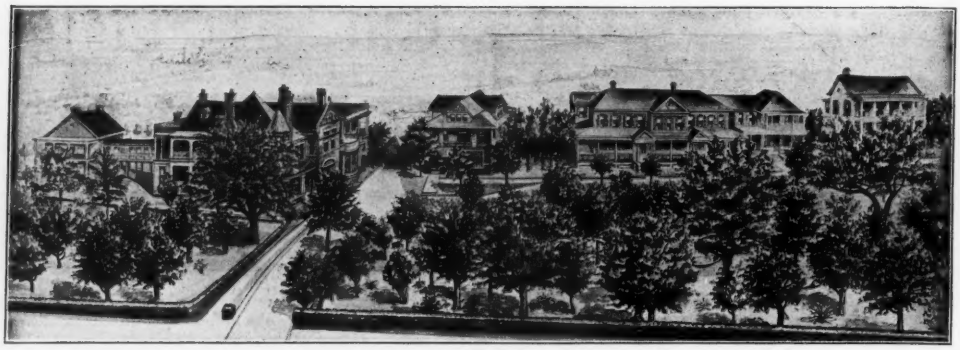

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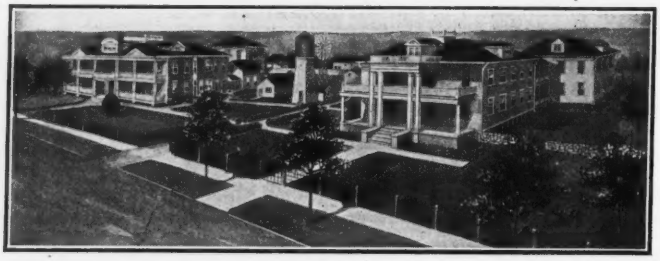

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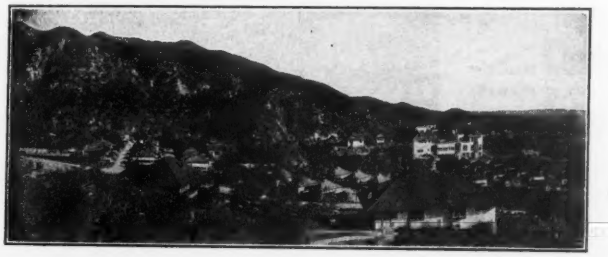

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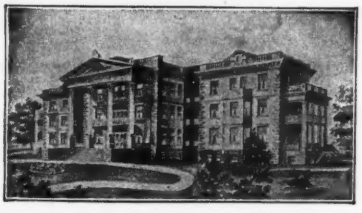

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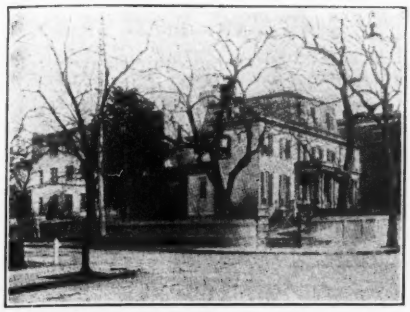

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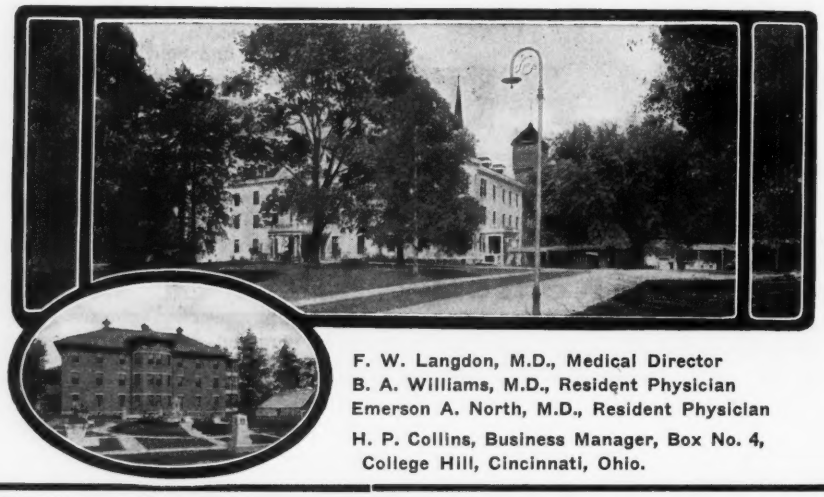

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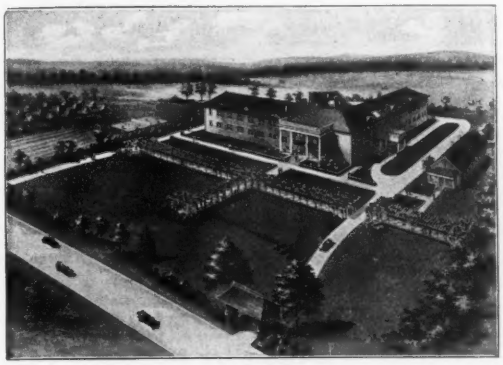

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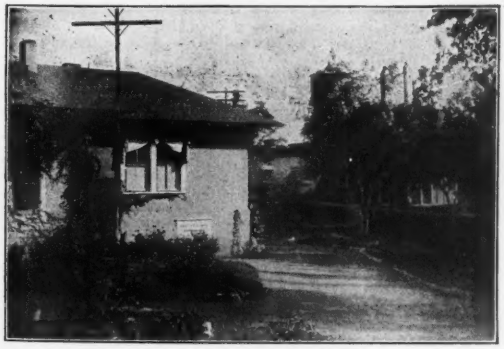

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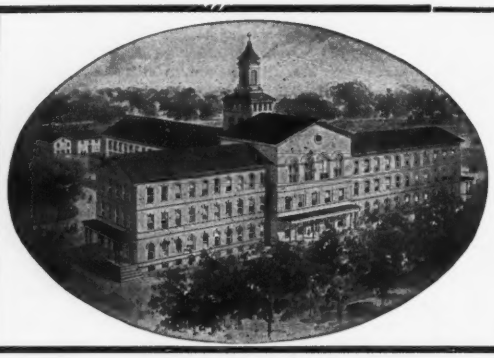

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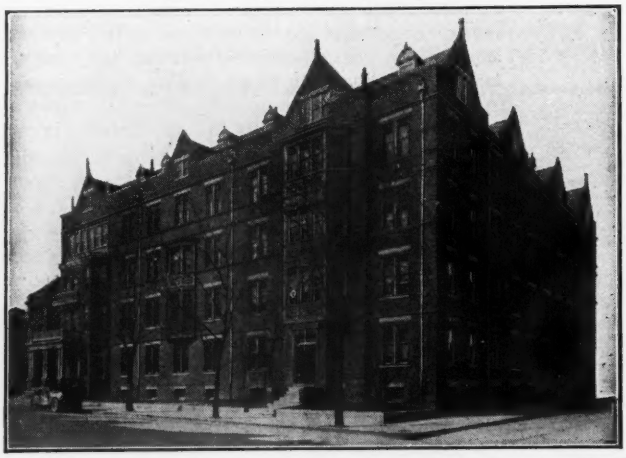

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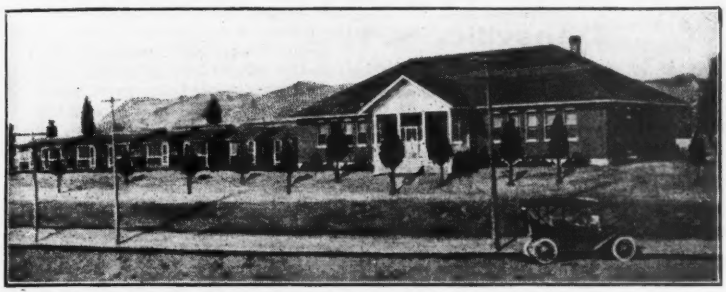

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Next session opens Oct. 2, 1916 and closes June 13, 1917

ENTRANCE REQUIREMENTS:

Completion of an accredited four year high school, or other equivalent of fourteen Carnegie units, without condition. In addition to the high school work all students must take one year of college work, which includes courses in Chemistry, Physics, Biology and a modern language. The total minimum hours, Didactic and Laboratory, in the premedical course are as follows:

SUBJECT	Total Hours Lectures or Recitations	Total Hours Laboratory Work	Total Minimum Hours Didactic and Laboratory
Physics, 1	64	128	192
Chemistry, 1	64	128	192
Biology, 1	64 or 96	128 or 64	128 or 160
German or French, 2	128 or 96	----------	128 or 96
Totals	320	384 or 320	704 or 640

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CLINICAL FACILITIES:

City Hospital, 185 beds with a large Outdoor Department. Vanderbilt Hospital, 85 beds with a large Outdoor Department. Galloway Memorial Hospital is now in the course of construction and will provide 150 charity beds. This Hospital is on the campus. Sections of students are also taken to the Davidson County Isolation Hospital and to the Central Hospital for the Insane.

VANDERBILT IS RATED IN CLASS "A" BY THE COUNCIL ON MEDICAL EDUCATION OF THE A. M. A. AND IS A MEMBER OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES.

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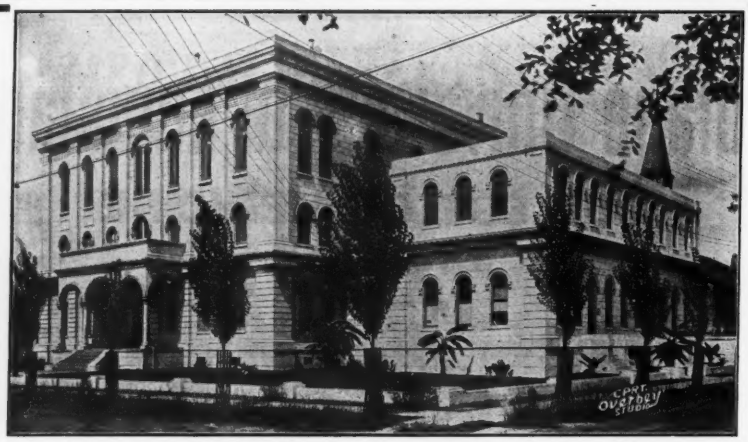

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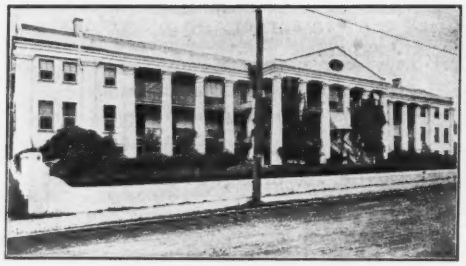

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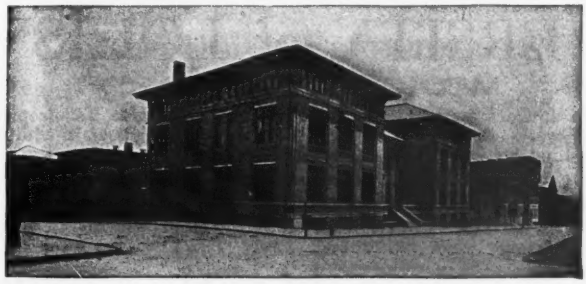

ATLANTA MEDICAL COLLEGE

Department of Medicine

EMORY UNIVERSITY, ATLANTA, GEORGIA

Sixty-Second Annual Session Begins September 25, 1916.

ADMISSION.—Completion of four-year course at an accredited high school, which requires not less than 14 units for graduation, and in addition, one year of college credits in Physics, Biology, Inorganic Chemistry and German or French. The "Premedical" Course will be given in the College of Liberal Arts at Oxford, Ga. Admission to the Premedical Course may be obtained by presenting credentials of the 14 units of high school work.

COMBINATION COURSES.—A student may enter the regular Freshman class on 14 units and attend the College of Liberal Arts for two years, after which he will be admitted to the Freshman Medical Class, and upon the completion of his Sophomore year in the Medical College can obtain the degree of Bachelor of Science, gaining his M. D. degree after another two years at the Medical College.

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Catalogue giving full information, also entrance blanks, will be sent by applying to WM. S. ELKIN, A.B., M.D., Dean.

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AND
College of Physicians and Surgeons

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Facilities for Teaching: Abundant laboratory space and equipment. Three large general hospitals absolutely controlled by the Faculty and thirteen hospitals devoted to specialties in which clinical teaching is done.

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For catalogue apply to J. M. H. Rowland, M.D., Dean, N. E. Cor. Lombard and Greene Sts. Baltimore, Md.

UNIVERSITY OF GEORGIA
MEDICAL DEPARTMENT
Augusta, Georgia

THE EIGHTY-FIFTH SESSION BEGINS SEPTEMBER 13, 1916; CLOSES MAY 31, 1917

ENTRANCE REQUIREMENTS

Candidates for entrance must have completed one full year of work in an approved college in addition to four years of high school. The college work must have included Physics, Chemistry, Biology, and French or German. These requirements are passed upon by the department of Secondary Education of the University.

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The course of instruction occupies four years. The first two years are devoted to the fundamental sciences, and the third and fourth to practical clinical instruction in medicine and surgery. All the organized medical and surgical charities of the city of Augusta and Richmond County, including the hospitals are under the entire control of the Board of Trustees of the University. This arrangement affords a large number and variety of patients which are used in the clinical teaching. Especial emphasis is laid upon practical work both in the laboratory and clinical departments.

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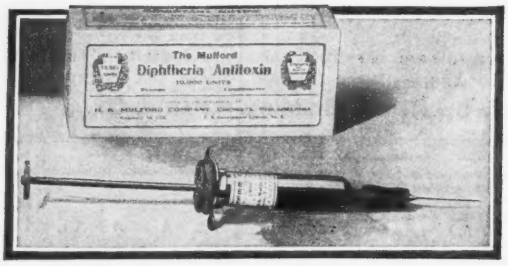

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SYPHILIS OF THE NERVOUS SYSTEM

By Beverley R. Tucker, M.D.,
and
Henry Jackson Hayes, M.D.,
Physicians to the Tucker Sanitorium,
Richmond, Va.

The purpose of this paper is to direct attention to the treatment and prognosis in cases of syphilis of the central nervous system as given by Schuster and Krafft-Ebing in 1908, and that of today as advanced by Amsden, Cotton, Fordyce and Ogilvie. In doing this we will consider briefly several important factors which are responsible for the change.

Schuster's conclusions in 1908 on the mercurial treatment of syphilis were: that the clinical development of tabes and paresis occurred in the same manner whether the patients were treated with mercury or not; that metasyphilitic nervous diseases appear in patients who have been treated with mercury no later than they do in patients not so treated; and that many facts derived from serological investigation appear to demonstrate the fact that metasyphilitic nervous diseases are not caused by the syphilitic virus, but instead are caused by the so-called syphilitic antibodies.

Krafft-Ebing stated in 1908 that the process of decay in the central nervous system goes hand in hand with an increase in the protective antibodies generated in the system. The process of decay he thought was first shown by an increase in the functional activity of the body, such as striking intellectual activity.

In contrast with these views, Ogilvie, in 1915, reporting eight cases of tabes and seven cases of paresis after fifteen months' standing, states that the laboratory findings of the blood and spinal fluid were favorably influenced in every case by proper treatment. This laboratory improvement was accompanied by concomitant clinical betterment. Amsden at Bloomingdale, reporting fifteen cases of paresis, secured very valuable results in nine cases with intensive salvarsan treatment. Fordyce, Tilney, Hough and Cotton have also obtained gratifying results with intensive salvarsan treatment in so-called parasyphilitic conditions of the central nervous system.

The difficulties which arise in the treatment of syphilis with mercury are well known to all. As to those cases of syphilis followed by involvement of the nervous system after mercurial treatment, we are of the opinion that this is due in a very large percentage of cases to insufficient treatment and to the failure to check up these cases from time to time, as we are able to do at present, by laboratory examination. No one disputes the belief that mercury has a decided lethal effect on the spirochetes.

The idea that metasyphilis is caused by antibodies generated in the system has been discarded some time ago. The idea that there is an increase in the protective antibodies in proportion to the process of decay in the central nervous system is fallacious, although there is, no doubt, an increase in the products generated by the spirochetes. We feel quite sure now that the increase in functional activity seen in these cases is far more apparent than real. The paretic and the tabetic are only able to do in reality a small part of either the

mental or physical work they have previously performed.

The terms metasyphilis and parasyphilis should be discarded. What we are dealing with, in the late manifestation of syphilis, such as paresis and tabes, are active syphilitic processes or tissue destruction caused by one time active processes. Moore and Noguchi demonstrated spirochetes in specimens from the brains of twelve paretics; and intensive intraspinal salvarsan treatment of the so-called metasyphilitic conditions gives results which tend to show that we are dealing with active processes.

In our work we have been able to obtain a decided clinical and serological improvement in a number of cases which fall into the groups of cerebral, cerebrospinal and spinal syphilis, using salvarsan intravenously in conjunction with mercury and iodid. This has been the experience of many others. The question which naturally arises is, Why is it that we have not been able to influence the so-called metasyphilitic manifestations more markedly?

In the cases studied by Moore only one showed the spirochete in the neighborhood of a vessel of any size. Tilney, Woolsey and Goldman in a series of very important vital staining methods showed that the central nervous system remained practically free of stain when this was introduced intra-arterially or intravenously, but when this stain was introduced intraspinally quite different results were observed as the dye penetrated deeply into the nerve tissue. Swift and Ellis, taking advantage of these facts, introduced the intraspinal method of treating syphilis of the central nervous system. With this method they were able to secure clinical and serological improvement in a number of cases which had not responded to intravenous salvarsan and mercury. This was a distinct advance in the treatment of syphilis of the nervous system. Many modifications of their work have been tried out. That introduced by Ogilvie seems to meet the requirements. In using the serum prepared according to Swift and Ellis we were unable to estimate the arsenical content of the serum. Following the technique of Ogilvie we know the exact amount of arsenic given at each treatment and are able to vary the strength of the serum at will. This brings us to a brief general consideration of the best method at present of treatment of syphilis of the nervous system.

The introduction of old salvarsan into the cord is attended with little or no real danger to the patient provided ordinary care is exercised in preparing the serum. The accidents which have occurred have been due to gross errors in technique. Neosalvarsan should never be used, as it is not a stable compound and is broken up by the heating necessary to form the spirocheticidal bodies produced in the serum.

The opinion, held by many physicians, regarding the late syphilitic manifestations of the central nervous system, is that very little can be done in these cases. Others maintain that by using intravenous salvarsan they are able to secure improvement in any case which can be improved. As to the late and apparently hopeless cases, we will say from our observation of quite a large number, that we have been able to arrest many of them and in addition have noticed relief of pain and improvement in the bladder condition. This means a great deal to one familiar with the suffering of these poor unfortunates. One case regained bladder control with five intravenous and one intraspinal treatment. We do not attempt to discredit the the intravenous use of salvarsan, but have satisfied ourselves that there are certain cases in which after many intravenous treatments with but little benefit, the employment of a standardized serum intraspinally has given improvement both clinical an serological.

Salvarsan intravenously is very efficient in those cases of superficial involvement of the nervous system, manifested by headache, slight grades of cranial nerve palsy and luetic vascular conditions. In one of our cases with intense headache and decided mental confusion the Wassermann was rendered negative and the cell count reduced from 160 to 12 by eight treatments. Regarding the intraspinal treatment of syphilis of the central nervous system in its resistant forms, those formerly called metasyphilis, we feel that when the intraspinal method is systematically and judiciously employed, it offers far more in the way of therapeutic possibilities than the use of mercury and salvarsan intraven-

ously. No matter what the clinical improvement has been, unless we can eradicate the biological evidences of the infection, we have not completed our work and destruction is taking place. At the present writing we do not feel that we have been using the Ogilvie method long enough to table final serological results, but we have cases now under treatment whose Wassermanns and cell counts are being altered and in whom the clinical improvement is marked. In one case with the unsteadiness and crises practically uninfluenced by six intravenous treatments and iodid and mercury those symptoms have apparently disappeared with two intraspinal treatments.

We feel that mercury and iodid should be included in the medication of syphilis of the central nervous system. Mercury by inunction has given the best results in those cases in which we have been able to use this form. Mercury by deep injection is probably better than by mouth, but Shamberg has recently shown that about 50% of the salicylate can be recovered from the site of the injection after three months. This salt showed the highest percentage of absorption. Iodid of potash is best given in a saturated solution. We think that large doses over a short period of time are better than small doses over a long period of time. A very important part of the treatment of these conditions is rest. Several weeks of almost absolute rest frequently produces a marked improvement, especially when this is followed by systematic exercises of precision, which tend toward re-education of the ataxic limbs. The neglect of the older measures of massage and exercise in tabetic cases is greatly to be regretted.

A CLINICAL STUDY OF EPILEPSY, PRELIMINARY REPORT.*

By Daniel D. V. Stuart, Jr., M.D.,
Baltimore, M. D.

The studies of which this paper is a preliminary report, were undertaken eighteen months ago, primarily in the hope of discovering something of value regarding the underlying factors of mental deterioration in patients suffering from so-called essential epilepsy.

Very little has been said in standard text-books and works of reference, about the numerical incidence of such deterioration; though all authorities appear to agree that it occurs in the great majority of cases.

So far as I have been able to find out, the only work as yet published showing the percentage of mental defect in epileptics, following their grading through the use of intelligence-tests, is that in J. E. Wallace Wallin's "Experimental Studies of Mental Defectives" (Ed. Psychology Monographs, 1912). In a series of 223 epileptics over 21 years of age, he found only 16, or 7.1%, to have a mental level of 13 years or above; using the Binet-Simon scale, 1908 revision. This high incidence of defect may, as he notes, have been due to the fact that his were "colony" cases, if it is assumed that patients of normal intelligence are more apt to be cared for at home. Wallin's monograph is a critical study of the Binet-Simon scale, however; not of epilepsy, and he therefore does not go into the histories of his cases.

The reconized fact that some epileptics give no evidence of any intellectual impairment, even after their illness has lasted for years; and that on the other hand, many show distinct deterioration in a relatively short time, seemed to offer a field for further investigation.

A group of 100 individuals was accordingly chosen from among those under treatment for "true" epilepsy in the Neurological Dispensary of the Johns Hopkins Hospital; and a searching inquiry was instituted into their family and past histories, and the development of their condition.

In order that the family histories might be as reliable as could reasonably be expected, only those patients were selected, one or both of whose parents were living and capable of giving an account of the forbears on both sides. All those showing definite focal symptoms, and all having positive Wassermanns or a luetic history antedating the epilepsy, were excluded for manifest reasons; otherwise the cases composing the group were picked purposely quite at random, and without

*Read before the Baltimore Neurological Society, March 17, 1916.

regard to age, sex, or the duration of the disease.

The method adopted was to divide the group into two sections; section A comprising those cases in which there was a family history of epilepsy, insanity, feeblemindedness, or chronic alcoholism on one or both sides; section B consisting of those in whose families no such history could be traced. Cases in which only an account of vague "nervousness" in one or two relatives, was obtained, were placed in section B.

Both sections were then put through the intelligence-tests; Huey's adaptation of the Binet-Simon scale, based on Goddard's 1911 revision, being the form used. Though the defects of these tests, especially in the upper ages (11-15), have often been pointed out; it was felt that they afford the best means yet published for grading the intelligence of patients. It also seemed incidentally that these studies might throw further light upon the shortcomings of the scale, in line with Dr. Wallin's work already quoted bearing in mind the fact that he used an earlier revision. In grading the individual cases, the method employed by Wallin was made use of,—i. e., the highest age passed by a patient was taken as his or her base-age, and one year additional was credited for each five tests passed beyond this age. Adult patients having an intelligence-level of 15 years were classed as normal.

The records, as outlined above, of 60 cases have now been completed, and form the basis of this report.

No definite conclusions have been drawn; nevertheless it is felt that even in this small number of patients, several points not without significance are brought out.

As it is hoped to follow this paper with a fuller study of the whole group of 100, no formal tabulation of results or of individual case-records is given; but merely an outline of what has been found.

Of the group of 60, 35 patients fell into section A. In other words, a distinctly neuropathic family history was obtained in 58.3% of the entire number. In the intelligence-grading, 16 out of the total were rated as normal, and of this number 10 were from the cases forming section B. That is, of the cases giving a clear family history, 40% reached the standard of normal intelligence; while, of patients coming from definitely neuropathic families, only 17.1% graded up to that standard. These figures are of interest in view of Gower's statement ("Epilepsy and Other Chronic Convulsive Diseases"), that "Heredity does not increase the probability of mental failure."

Obviously, the length of time during which the patients had suffered from their disease, and the frequency of the attacks, might be thought to have borne a causal relation to these findings. However, the importance of these two factors in this connection apparently disappears on further examination of the records.

These are as follows for the six cases with normal intelligence in section A:

Case:	Age at Onset:	Duration:	Av. frequency of attacks:
S. M.	7 yrs.	15 yrs.	One a day.
L. R.	3 yrs.	10 yrs.	One a month for 3 yrs; remission for 3 years; then one every 4 months.
P. F.	20 yrs.	7 yrs.	One every 2 months.
P. C.	5 yrs.	6 yrs.	Two a week.
J. R.	19 yrs.	5 yrs.	One a week for 3 yrs; none since.
L. C.	12 yrs.	2 yrs.	One every 2 months.

For the ten "normals" of section B, the records show:

Case:	Age at Onset:	Duration:	Av. frequency of attacks:
J. R.	4 yrs.	22 yrs.	One every 2 weeks.
A. H.	16 yrs.	17 yrs.	Three a week for 4 year; remission for 9 yrs.; then two a week.
J. C.	8 mos.	17 yrs.	One every 6 months for 7 yrs.; remission for 7 yrs.; then one a week.
H. Z.	7 yrs.	12 yrs.	One a week.
M. R.	2 yrs.	8 yrs.	One every other day.
H. H.	18 yrs.	7 yrs.	One a week.
E. H.	29 yrs.	6 yrs.	Two a week.
E. W.	5 yrs.	5 yrs.	One a month.
M. M.	19 yrs.	2 yrs.	One a month.
J. K.	15 yrs.	2 yrs.	Two a week.

That is, the average duration of the disease is practically identical for the undeteriorated individuals in the two sections (a fraction over nine years); and there is no appreciable difference in the frequency of their attacks. These facts are in partial agreement with Gower's work. He says that the factor of frequency "cannot be regarded as possessing a considerable influence" on the development of deterioration; but on the other hand he makes the statement that "duration of the disease has . . . a distinct influence on the occurrence of mental failure."

In the series under discussion, the type of seizure apparently bore no relation to

the onset of deterioration. 31 of the 60 patients reported both major and minor attacks in irregular rotation. In 13 the condition began with minors, the majors supervening at a later stage. 26 gave a history of major attacks only; while 3 were said never to have had grand mal. These latter came under section B. Two of them (M. R. and E. W.) were rated as of normal intelligence; while the third was classed as a moron.

The kind of treatment received by the patients before applying at the Dispensary, might have had a bearing upon their mental status; but unfortunately this question was indeterminable except approximately. From what could be learned, all the individuals examined had been under bromid medication at intervals of varying length since the onset of the attacks.

As will be noted, in one of the cases classed as having normal intelligence in section A, an interval of three years of freedom from attacks was said to have occurred. In one case in section B, the patient was reported to have had a free interval of nine years; and in still another, an interval of seven years. If these reports are trustworthy, they appear to uphold the wisdom of never completely stopping treatment in epilepsy.

To take up the cases showing mental impairment: section A contained 24 morons (mentality of from 8 to 12 years, inclusive), 3 imbeciles (mentality of from 4 to 7 years, inclusive); and 2 idiots (mentality up to and including 3 years). Section B contained 14 morons, 1 imbecile, and no idiots. The deteriorated patients with clear family histories therefore, apparently tended to grade higher in the scale of intellectual capacity than did the same type of individuals coming from neuropathic families.

In such a small group of cases, this factor, taken alone, would be worthless. It may have been quite accidental, and is subject to revision on more extended study; but when looked at in conjunction with what has been learned of the percentage of "normals" in each section, it is interesting.

As concerns the intelligence-levels of the individual morons, practically no difference was found to exist between the members of the two sections, the average mentality of those in section A being 10 years, and in section B, 9 years. The relatively high proportion of morons among the deteriorates agrees with Wallin's statement regarding institutional cases, that "the typical epileptic condition is moronity."

Four of the sixty cases showed clinical evidences of dyspituitarism. Three of these were included in section A, all of whom were deteriorated, two being classed as morons and one as an imbecile. The remaining case graded up to normal intelligence, and came under section B. This, like the factor of preponderance of high-grade deteriorates in section B, may have been due to chance; but again like the same factor, it is of interest.

Another point worth noting is the age of the individual patients at the time of onset. As will be seen from the tables given, the disease first showed itself in the first decade of life in three of the cases quoted from section A, and in the second decade in the remaining three; while in those from section B the attacks began in the first decade in five cases, in the second decade in four, and in the third decade in one case. This very close agreement between the sections was rather unexpected, and cannot be evaluated properly until after further study of the whole number.

In carrying on the work, it is intended to obtain cranial and abdominal X-ray studies of a selected number of cases from the full group together with an equal number of "controls" not suffering from epilepsy.

Other points have also arisen during the course of this survey, which will be taken up as occasion offers.

804 *Cathedral Street.*

OCULAR COMPLICATIONS OF MALARIA AND THE TOXIC EFFECT OF QUININE UPON THE EYE.*

By Wm. T. Davis, M.D., F.A.C.S.,
Washington, D. C.

These interesting and important subjects have been thoroughly studied by numerous observers. To de Schweinitz we owe our most precise knowledge of the pathological and ophthalmological changes.

They are important to the general prac-

*Read before the Medical Society of Northern Virginia and the District of Columbia, Nov. 7, 1915.

titioner, particularly to those practicing away from cities where a specialist is not of easy access. The eye conditions are relatively few and easily recognized and the treatment simple. Thus a knowledge of these conditions will result in preventing suffering and in saving sight. It is another fact to add to our knowledge of the etiology and pathology of disease which on occasion will be sure to find a valuable use. Particularly is this true in the South, the sub-tropics and the tropics whither the march of progress has been leading us.

We will first consider a few points in the general pathology of the malarias which seem to apply to our subject. Craig states that anemia appears very early and is due to a rapid destruction of the red cells from two causes, the toxins of the plasmodium and to a greater extent the occupation of the red cells by the organism itself. The red cells may fall from normal to three million in 48 hours. The anemia tends to reach a certain grade and remain fairly constant. The return to the normal is fairly rapid much less so however in the estivo-autumnal type. Dionini says in the infections with the ameboid forms, during the periods of apyrexia there is no return of the reds to normal. There is leucopenia. When, however, a leucocytosis is present it indicates infection with the pernicious forms and the prognosis is much more grave. If the leucocytosis persists or increases the prognosis is bad. If it disappears, recovery may be expected. This is a most important fact and should not be overlooked. Golgi and Metchnikoff think that to the phagocytes we owe spontaneous recovery in malaria. They destroy and engulf the organisms. The malaria phagocytes are the large mononuclears, transitionals, certain of the polynuclears, the endothelium of the liver vessels, i. e., Kupffer's cells of the liver, cells of the splenic pulp and the uninuclear cells, marrow cells of the bone marrow. In the most pernicious forms the endothelial liver cells may be found in the peripheral circulation.

The amount of pigment and cellular detritus absorbed by the phagocytes is enormous, and there can be no doubt that these cells are of inestimable value to the body in taking from the capillaries and small vessels this material which might so easily occlude them. In this way phagocytosis is of immense value, for without it we would observe pernicious symptoms in the majority of cases. If we find in the peripheral blood numerous large mononuclears and macrophages it indicates a severe infection and bespeaks a grave prognosis.

The pigment found in the blood and tissues is formed in the body of the parasite from the red cell. It is set free when the parasite sporulates, is taken up by the leucocytes and deposited by them in the tissues, especially the brain, liver and bone marrow. In the same way it is deposited in the fundus of the eye and may resemble inflammatory conditions. The pigment reaches the tissues also by rupture of the capillary vessels which have become occluded by phagocytic leucocytes and masses of the pigment. There are found in the spleen, liver, brain and other vicera areas of focal necrosis due to toxic substances in the circulating blood. This toxin is more powerful when derived from the estivo-autumnal variety. It seems very probable that these toxins would act upon the choroidal coat or the retina producing here areas of degeneration or necrosis and thus account for many otherwise unaccounted-for areas of choroiditic or retinal atrophy, hemorrhage or sclerosis.

In the brain the following pathological conditions obtain: Small capillary hemorrhages due to blocking of the vessels by pigment or pigment bearing leococytes. Thrombi of the plasmodia may be found in the capillaries. The nerve cells show disappearance of the Nissl granules and the protoplasm is rarified. The nuclear membrane of the nucleus may disappear as may the nucleolus. In the processes of the cell we may have nodal formations or beaded appearances. Bleb-like appearance on the dendrites may be connected by slender filaments of protoplasm. *The changes in the retina correspond to those in the brain.*

In the latent types with no symptoms and no organisms in the circulating blood, the whole human cycle of the parasite is completed in the spleen. Hammond says emboli formed of the pigment granules occur in the cerebral and nervous tissues. Also thrombosis may occur from the gradual deposition of the pigment along the walls of the vessels, thus gradually leading to occulsion. It may easily be seen how this condition can cause occlusion of

the small vessels in the choroid and retina, leading to optic atrophy partial or complete, macular degeneration, areas of atrophic choroid and retina, and various other degenerations. Stellate masses of pigment may be deposited about the fundus, particularly along the blood vessels resembling retinitis pigmentosa. Thus examination of the fundus may lead us to a diagnosis of a chronic malarial poisoning.

Herbert Parsons says ocular complications occur in 10% of the cases of malaria. Apart from conjunctivitis, corneal affections are the commonest, as herpes febrilis with dendritic ulcers, interstitial keratitis, iritis, irido-cyclitis, metastatic ophthalmia, retinitis pigmentosa, choroiditis, vitreous opacities, retro-bulbar neuritis, cataract, glaucoma, retinal and vitreous hemorrhages. Weeks says, among other conditions, that cataract developing rapidly in young persons may be a result of malaria. The papillitis of malaria is of a general nature, central scotoma is a rarity, as is also complete atrophy. The tendency to hemorrhage is marked. Small hemorrhages are frequently seen on the disc and in the retina. The venous engorgement is apt to be out of proportion to the other changes.

Fuchs says keratitis profunda may be caused by malarial cachexia. This condition is characterized by a deep, disc-like, thick opacity developing exactly in the center of the cornea. Sometimes without severe inflammatory symptoms. It is absolutely disastrous to vision.

De Schweinitz mentions an intermittent ophthalmia which may occur as simply a vascular irritability of the eye with conjunctival congestion and photophobia, lachrymation and neuralgia, — malarial neuralgia. Another form in which there is an erysipelatous swelling of the lids, swelling of the ocular and palpebral conjunctiva, with its surface studded with red dots,—small subconjunctival hemorrhages, sometimes with involvement of the cornea, with opacities, and loss of vision. The dreadful interstitial keratitis may be caused by it. Also herpes of the cornea leading to corneal ulcer. The characteristic malarial corneal ulcer is the dendritic ulcer which is narrow, serpiginous and superficial, with lateral off-shoots, very painful at intervals, at other times having no pain at all, but only symptoms of irritation. These ulcers are arranged like the skeletal veins in a leaf. Severe neuralgia may accompany the condition. Instead of this typical ulcer we may have a large superficial abrasion of the cornea occurring suddenly and without traumatic cause. Anesthesia of the cornea may accompany it with ciliary neuralgia.

Amaurosis may occur and remain for some time, or may be periodical, occurring with the malarial paroxysms. It may be unilateral or bilateral. It may go to complete blindness, lasting several hours to several weeks, and disappear as suddenly as it came, leaving no trace in the fundus. Or it may be associated with spasm of the retinal vessels, showing with the ophthalmoscope small arteries, pale disc, and shrunken veins.

At the same time there may be congestion of the face and ears.

We must exclude in such cases kidney disease and quinine amaurosis.

Optic neuritis may undoubtedly be caused by malaria. The condition is mild, but may go on to atrophy in the pernicious forms. Even where the condition is advanced, great improvement may be had under quinine and iron. Hemorrhages into the retina are not uncommon. They are on the disc as very small ones, along the course of the larger vessels, and less often in the macular region. Here, of course, they are more serious. They are ascribed to pigmentary emboli and increase of tension in the arteries. It would seem that it might also be due to a toxic arteritis from damage to the vessel walls by the toxins. Hemorrhages into the vitreous are also relatively frequent, as are also serous effusion into the vitreous. We may have concentric contraction of the field of vision or a central scotoma which may so greatly enlarge during a paroxysm that the whole field is involved and blindness result. Hemianopsia may occur. Paralysis or spasm of the accommodation may occur, night blindness or paralysis of the external muscles of the eye.

Kipp says in certain cases of intermittents there will be noticed first an early irritation of the eye. If examined now, there will be seen several slightly raised irregular lines on the cornea; these lines increase in length; and the middle portion breaks down and forms an ulcer. The condition may stop here or the ulcer may con-

tinue to grow in this sinuous serpiginous way or may creep across to the center of the cornea. It is very shallow, and the edges have a bluish appearance. The deeper layer of the cornea remains clear as a rule unless the condition is mistreated. Iritic irritation may be present, but no hypopyon.

A case has been seen in a nursing infant whose mother had malaria. This was probably due to the toxins absorbed by the infant. If this is true, it places this form of keratitis in the same category with the innumerable cases of keratitis we see in the strumous diatheses, the so-called rheumatic diatheses, etc.

Two symptoms should lead one to suspect a malarial condition, — tenderness of the supraorbital nerve and anesthesia of the cornea. It is important to recognize the condition early. Only the specific action of quinine will relieve the ulcer. Local treatment alone will not do it. If we are to save the patient's sight unimpaired, it must be controlled before it has crept to the center of the cornea. Only the specific treatment can accomplish this. The condition is probably trophic in origin, due to the involvement of the cells in the Gasserian ganglion.

Howe says the causes of recurrent paralysis of the third nerve are obscure; in those cases that are periodic malaria should be suspected.

Jackson mentions, among other things, chronic keratitis and sudden anemia of the retina, followed by atrophy of this organ.

THE TOXIC EFFECT OF QUININE UPON THE EYE.

De Schweinitz has done some very convincing experimenting upon dogs and observed the following pathologic changes. The retinal arteries were observed to become rapidly smaller, and the disc rapidly paler. The veins were also contracted. Microscopically there is seen to be an endovasculitis of the optic nerve vessels, the walls becoming thickened and changed. There is complete atrophy of the visual path including the optic nerves, chiasm and tracts. The original effect is upon the vaso-motor centers producing constriction of the vessels. Later the changes take place in the vessel walls. Thrombosis may occur. Degenerative changes also have been noted in the ciliary ganglion. The drug seems to have a selective action upon this part of the nervous system. The degeneration in the optic path is an ascending one and commences in the ganglionic layer of the retina. These cells show early degeneration, paleness, absence of chromophilic granules and breaking down of the cell body. Also there are degenerative changes in the nerve fibres with deposits of myelin. Thrombosis of the central vein of the retina occurred in one case. After a year or more, ophthalmoscopic examination showed the vessels to have undergone degeneration as evidenced by white lines on either side of the vessels. In some cases there is nothing left save a white cord of sclerotic tissue in place of the vessel. In the choroid there are areas of sclerosis of the vessels and pigmentary changes showing how serious the results are. Vacuolization of the cells in the cortical visual area was observed. This was thought to be an artefact.

Buller thinks the blindness is due to rapid effusion into the lymph spaces around the optic nerve sufficiently to produce edema and blanching of the retina, due to interference with the retinal circulation.

The dose that will cause blindness is usually a large one though not always so. Temporary amaurosis may come from as small quantities as gr. ii. The larger doses given in malaria are probably neutralized by the malarial toxin, as bad results are rarely observed after them. In the milder forms of poisoning by this drug we have temporary amblyopia, diminution of the accommodation and moderately dilated pupils. In the severe cases there is sudden and absolute blindness likened to the sudden extinguishing of a lamp. It may however come on more slowly. There is complete loss of light perception with subjective sensation of light and color. The disc is very pale, as in advanced atrophy, great diminution in the size of the arteries, grayish haze of the retina, and cherry red macula, simulating closely the appearance of the fundus in embolism of the central artery. The choroid is pale, there may be nystagmus, divergent strabismus and anesthesia of the conjunctiva and cornea. The restoration of vision is gradual and is partial or complete. There is usually partial color blindness remaining with more or less contraction of the visual field.

Absolute blindness does not take place as a result of quinine poisoning, yet there may be permanent diminution of the light sense. A case of Greuning's was color blind with contracted fields after six months. In another case there was still impairment of vision after 7 years, following a very transient amaurosis. Immense doses of quinine are frequently taken without disastrous consequences, and while blindness may always be expected in cases of lethal doses, it is impossible to fix within definite limits the non-lethal dose. It depends much upon the individual idiosyncrasy. The results are so terrible that even the remote possibility of it's occurring should have influence in placing some check upon quinine which is but too often used carelessly in the treatment of disease.

Parsons observes that there are important differences in this condition and the alcohol and tobacco amblyopias. In the former there is either complete amaurosis or peripheral contraction of the field without central scotoma. Night blindness may also be caused. The essential factor in the condition is a retinal ischemia. It is a question as to whether or not the drug has an effect on the retinal cells. It has been shown however that the movement of the cells of the pigment epithelium of the retina is lessened. The ischemia is a passive process and is due to extreme congestion of the splanchnic area. This does not agree, as you may note, with de Schweinitz's investigations. I am inclined to accept Parson's view however as Halleburton states that the vessels of the heart, lungs and brain are less influenced by the vaso-motor system than any of the arterioles in the body. It would thus appear that such an extreme contraction as an active process due to stimulation of the vaso-motor system of the retinal vessels is unlikely to occur.

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MODERN MEDICINE

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From the oldest historical records down to the present time there has always been a certain percentage of the human race which has professedly devoted its attention to the care of its remaining members. True it is that in earlier times the amount of exact scientific knowledge in regard to the nature and structure of the human body and the ills which prey upon it was exceedingly meager; yet it is astonishing to learn what remarkable intuition of the cause and nature of disease these fathers of medicine possessed. Some of their enunciations are still epigrammatic and serve as basic principles in the evolution of the modern physician.

In ancient times their methods were often most crude and fantastic, but what else could be expected where the mythical and the supernatural were the guiding principles in their avocations.

Little by little, however, the horizon of empirical knowledge widened as men observed the action of therapeutical drug preparations in the human body and noted their effects. In later years the study of anatomy, physiology and kindred subjects added to this classic lore; but only in modern times did the true spirit of scientific investigation penetrate and dissipate the clouds of mysticism and superstition concerning the causation and treatment of disease.

To this end the microscope, the discovery of staining reagents, the nature of ferments, and, lastly, immunization, have contributed largely and from this enormous number of accumulated facts there has gradually been woven that complex fabric known as modern medicine.

Officialdom has openly acknowledged the medical profession and given it a recognized standing. Its members are supposed to dictate all measures relating to the prevention and cure of the ills of mankind, of which monopoly the physicians are justly jealous, resenting any encroachments on its prerogatives. However, the personal liberty of the subject which is the keystone of the constitution of this country, permits the patient to seek relief from suffering from any source he or she may desire. Hence we find that successful rivals to our profession have arisen, and under various nomenclatures are usurping fields that we have thought to be peculiarly our own.

We see today the osteopaths, osteotherapeutists, vitopaths, somatopathists, ocultists, Christian Scientists, and advertising specialists of all kinds, posing as healers of the sick, clamoring for official recognition, charging for their services a fee which compares favorably with our own, and securing a patronage which makes us blush with shame at our own ill-success. Is it not humiliating to see patients seeking advice and finding relief by unethical means, when we, the followers of the regular schools, inheriting its traditions, trained in its principles, and disciplined in its laboratories of anatomy, physiology, pathology and therapeutics, are silently passed by?

We see also the patent and proprietary medicine vendors reaping ever-increasing harvests through channels of commercialism denied the regular ethical physician. This can only be interpreted as a growing lack of confidence in him by the public.

In view of these conditions can we fail to ask the question, why does such a condition of affairs exist? Where does the responsibility lie? What is the remedy?

It is obvious that the ever-increasing following of these cults and the growing numbers of consumers of patent and proprietary medicines show something radically wrong in the practitioner himself, else the erstwhile confidence of the patients in the physician would be irrevocably fixed or grow stronger. If we physicians are to blame, let us not evade the issue nor shirk the responsibility, but frankly acknowledge our shortcomings and endeavor to remedy the evil on rational lines. Do cults utilize unknown, unphysiological means, or are they well-known physiological measures developed and elevated to the dignity of a profession? We must undeceive ourselves if we consider for one moment that these cults do not obtain good results.

No one who has studied their methods and been brought in contact with the results can fail to acknowledge that in special cases they succeed where the regular physician has failed. We do not mean to infer that every regular physician would have failed in individual cases. It is results that patients seek and they are perfectly indifferent as to the means employed. If we are unsuccessful in our methods and the unethical practitioner is successful, must we blame the patient and condemn the cult? Is it not better, first, to investigate and inform ourselves thoroughly of the methods employed before we publicly condemn and by our condemnation heap opprobrium upon ourselves? If there be an atom of science in their practice, though obscured by the impedimenta of charlatanism, should not our attitude be to rediscover and scientifically crystallize it? If we neglect to utilize ethically that which is within our reach; and others do, unethically, who is to blame?

Let us briefly pass in review our present relationship to the patient. The epoch-making strides which medical knowledge has made in the last half century have put into the hands of the physicians weapons of defense and offense against disease little less than miraculous. Investigations have been pursued along many lines and the growing store of medical knowledge has increased so rapidly that it seems almost impossible for any man to keep pace, hence has developed specialism, and the patient is now tossed from physician to surgeon to specialist 'till he or she knows not whence to seek relief. This condition of things has resulted in the lessened prestige of the family physician, who should still remain the diagnostician and determining factor in the method of treatment to be pursued, or the specialist to be consulted. The tendency seems to be for the layman to diagnose his own case and lay his symptoms directly before the specialist whose knowledge of general causation is often unfortunately so limited that he fails to recognize a constitutional affection and goes dabbling away in a localized area, frequently to the serious and irreparable injury of the patient.

Our profession has had, and is having, its manias on whose temporary altars many a life has been, and is being, forfeited. It requires no great stretch of memory to carry us back to the drug-mania days when concoctions were devised and doses given that were not only repellant and disgusting to the suffering patient, but threatened his very existence. Was it an unhealthy reaction from such monstrous and fatally depressing over-

medication that led to the introduction of homeopathy? Its original tenets are spurned now by every sane man, but the results obtained through the practice of homeopathic methods proved to every one that the profession was over-drugging and it has been wise enough to profit by it. The followers of homeopathy today have departed from the rules upon which the system was founded, and are now employing rational methods, though under a false hypothesis.

The introduction of aseptic methods enabled the surgeon to broaden his field, forego conservatism and attempt operations hitherto undreamed of outside the realms of insanity. So aggressive has he become on occasion that a passing pain has been but the necessary incentive to the ablation of some structure of more or less physiological importance.

Pathology, too, has run the gauntlet of undivided medical attention and has thrown light upon morbid processes hitherto obscure. It has enabled us mentally to recapitulate the progress of disease and prognosticate the inevitable result. Enchanted by its revelations, patients are considered living laboratories for bacterial evolution, and not individuals who seek our advice to be relieved from suffering. Our medical courses have become so altered by its exaggerated importance that clinical teaching is everywhere sacrificed to its investigations, and we graduate from our medical institutions more familiar with the conditions of the dead than with the morbid living.

The laymen, too, are not free from manias and no matter how preposterous may be the claims of any cult, it always has its professed followers. Homeopathy became a fad for many years and eventually modified our methods of drug medication, and now we find two other flourishing cults, the osteopaths and Christian Scientists, prominent and successful healers of the sick.

For this condition of things the physicians are not free from reproach. They are at fault if judged from two standpoints, — first, diagnosis; second, therapeutics. In regard to the first, the cursory examination so often made and followed by the inevitable prescription, is too common and well-known even for comment. The most frequent mistake in diagnosis, however, is the failure to distinguish between organic and functional troubles. The number of organic troubles which can be simulated in a functional patient is legion, and the failure to recognize the neurosis leads more physicians into a helpless attitude than anything else,— discouraging alike to both. A physician should never attempt to relieve a pain, headache or any other symptom of any degree of chronicity without first ascertaining if functional stigmata be present, and no well trained modern physician should be ignorant of them. If a patient possess one or more of these, attention should be directed toward the treatment of the functional trouble; else will be localized symptoms complained of be aggravated by drawing the patient's attention to them.

The next great fault of the physician is his ignorance of therapeutics. To such an extent does this exist among our profession that in some quarters a therapeutic nihilism is openly advocated and practiced. Some physicians feel that their duty is done when they have made a diagnosis and informed the patient of his impending danger, meanwhile growing enthusiastic over the beautiful case presented.

It may be asked, did that patient seek the physician's advice to put himself on exhibition or to obtain relief? Did he pay the price to be informed that he would die soon or to seek to have his life prolonged; to subserve the ends of science or to have the ever-buoyant hope cheered, strengthened and encouraged, and not absolutely crushed by us, the arbiters of life and death? Patients seek us because they are sufferers mentally or physically. They come to be encouraged, cheered, relieved, to learn wherein they have deviated from the paths of health, and to be directed into the proper channels; in other words, to seek our advice and assistance. A great mistake which so many men make is that they consider their patients' *cases;* the personality, the individuality is left in abeyance. They are merely complicated myriads of cellular units more or less harmoniously arranged, working somewhat automatically under the guidance of a ma-

terial nervous organism, and requiring at times a dose of oil or an occasional ablation of some diseased part. Mind, mentality and its dominating influence never enter into the question, are never considered: a patient is only a case. The physician's knowledge can admit of nothing more. Therefore it does not exist. Because we can not see the ether impulse utilized in wireless telegraphy pass, must we say it does not exist, but that the effects at the receiver must be due to the chicanery or the secret machinations of its advocates? If an untrained eye sees as much beauty in a chromo as in a Raphael, on whom does the criticism reflect? If we deny the power of mental influence it does not negative the possibility of its existence. There is as much common sense in the one as in the other. The physicians who ignore mental influence in disease overlook a cardinal principle in properly diagnosing morbid processes.

In regard to modern therapeutics, treatment should not be confined to the administration of drugs, as is so erroneously thought and so commonly practiced. It is but one measure in the means of relief at the disposal of the well-equipped physician. Properly taught therapeutics should have some such grouping as the following: hygienic, dietetic, drug, surgical, electro-, radio-, mechanical, serum, mental, hydro- and organo-therapy.

If we would succeed as physicians, we must be able to direct patients to the practitioners of the different therapeutical measures if we do not practice them ourselves. Otherwise, let us not impute blame to patients if they seek relief by measures of which we are ignorant, whose practitioners we disregard, and their results minimize.

That the osteopathic physicians do get results is not surprising. They have utilized well-recognized physiological principles in the founding of their system which we physicians have practically ignored, or at least have but trifled with in our methods of treatment.

The principles are these: that the individual cells of the body depend for their activity not only on a proper supply of fresh air and nutriment, but also on proper innervation. The sympathetic nervous system controls the quantity of blood supplied to any definite part, through its distribution to unstriped muscular cells. It also controls secretion, excretion, and in fact all the organic reflexes. The ganglia of this system are so located in relation to the articulations that they can be stimulated by mechanical movements through methods utilized by the osteopaths and teachers of physical culture. Hence they are in a position directly to influence and stimulate the nutrition of any organ. They aim at adjustment through deep-seated nerve and circulatory stimulation.

By the same methods they can often succeed in breaking down old adhesions and thus restore physiological function in organs sluggish or inactive. They have in consequence a large field in which to operate and obtain results which we therapeutists fail to get, not because we can not understand but will not, through ignorance and blind prejudice against the adoption of such means. The name osteopathic is a misnomer. Its founder supposed that all deep-seated congestions were due to displaced bones or mild forms of dislocation, and by the restoration of these, the symptoms were relieved. Occasionally this may be true, but deep-seated congestions which are responsible for many pathological conditions are directly influenced and relieved by mechanical means.

Massage as generally practiced has only a superficial or reflex action, and does not affect to influence deep-seated congestions except in a very mild manner. Those of us who confuse massage and osteopathic methods have never taken the trouble to investigate the latter.

These methods of treatment, viz: osteopathic, physical culture, massage, etc., should all be grouped together under some such nomenclature as mechanical therapeutics, and be practiced by men who are willing to treat patients requiring such manipulations, and not leave them for a class of men, some of whom, through their ignorance of pathology and etiology, blunder along, frequently doing more harm than good, while affecting to relieve everything. Within proper limitations mechanical therapeutics could be made a strong arm of

the medical profession instead of a successful rival as it now is.

Is it not surprising what a small interest today physicians take in mental therapeutics? Why is it? Does the natural spirit of opposition innate in man resent the intrusion of charlatanism in his domain to such an extent that, disgusted, he negatives the possibility of mental influence? Or is it because, through the lack of investigation, he is absolutely ignorant of mental phenomena and relegates all such to the domains of superstition and diseased imaginations?

No matter what the cause, the physician's neglect of mental therapeutics has resulted in the gradual development of that now widely disseminated cult, Christian Science, and its congeners. Although the philosophy upon which the system is founded is as illogical as it is foolish, still the methods of treatment adopted are absolutely in accord with the principles of suggestive therapeutics.

Modern methods of living, among the wealthy classes particularly, conduce to a condition of hypersensitive introspectiveness, and the social habit of comparing notes in regard to subjective sensations and objective symptoms leads to a series of imaginary ills purely functional in character but sufficiently real to incline them to seek medical aid. If the specialist consulted should perchance find some local hyperemia and advise treatment, the fixed pathological idea in such an individual is almost certain to become aggravated instead of bettered. It is this class of people which the Christian Science philosophy will cure by training the patients to a condition of mental passivity and receptivity, and by suggestive therapeutics incline them to the idea of material nihilism and consequently the subjective sensory impossibility. This mental influence over our sensations, though openly recognized as a cardinal principle by all students in experimental psychology, is still an abeyant factor in practical medicine. It is, however, that principle which we unconsciously practice when patients are cheered, encouraged and bettered by the physician's visit, even before the dose is administered, and the administration of which will be the more effective in proportion to the confidence and faith which the patient has in him. Mental therapeutics should be taught to every student before he begins his regular professional work, and thus reclaim this vast domain from the practice of charlatanism, which now practically controls it.

Fortunately, electro-therapeutics has been rescued from these fields, although there are a great many reputable physicians today who practically deny any therapeutic value to these methods. Their ignorance of the subject is to be deplored, and we are glad to say is confined chiefly to those older physicians who have never taxed their mental capacity with its acquaintance and whom time will make important factors as active opponents to their use.

Serum therapeutics has fortunately never been out of the hands of skilled, ethical scientists and probably never will. It is to be hoped so, at least.

What shall we say of drug commercialism? It is true, as above stated, that the patent and proprietary medicine vendors are reaping harvests while we, the honest workers, are suffering. Are we altogether blameless?

If we were to examine the prescriptions which come into any recognized drug shop we would probably be surprised to see a tremendous percentage of them prescribed by number or copyrighted name, with some manufacturing company's name beneath. The physician often has the haziest idea of the contents of the preparation or the dosage he prescribes, but does so because it is recommended by the manufacturers. The manufacturer recognizes that palatability is a *sine qua non* of its marketability, and sacrifices physiological essentials to that end. On running over the list of drug preparations in the form of pills, tablets, etc., it is most striking to find the most ridiculous physiological incompatibles combined and labeled as cure-alls for affections of different organs or different symptoms. It all goes to show that we who have been and still are largely drug physicians, are losing the art of prescribing and leaving that, upon which largely our claims as physi-

cians are based, in the hands of manufacturing chemists who flaunt their elixirs, peptonoids, migrain tablets, kidney pills, etc., before the physician, who readily becomes their prey because of his inability to prescribe physiological, compatible, palatable preparations.

We ourselves are to blame for this state of affairs and must inwardly reform before we endeavor to reform others. If we did our work properly, scientifically and honestly, and understood thoroughly the art of prescribing, there would be no need of the palatable shotgun preparations that the patent and proprietary medicine vendor manufactures. In each one there is some well-known drug on which its virtue depends and in selected cases does good. If we fail to cure our patients and the manufacturing chemist does, who is to blame? It requires little logic to reply.

In our teaching institutions lies the remedy. Our professors of therapeutics must know and be able to teach something more than drugs if they would instruct students how to take care of patients properly, and thus retain and perpetuate the prestige of the profession we have inherited. Every one of the above mentioned branches of therapeutics has its value in individual cases, and by understanding thoroughly and putting them into practice, we would do more to smother our charlatanism than all the legislation adopted to that end.

In conclusion, if we would war successfully gainst osteopaths let us utilize their methods, if on fair-minded, judicial inquiry they are found to be physiological, and adopt mechanical therapeutics as one of our every-day measures. If we would destroy that abnormal growth, Christian Science, let us recognize and learn something about mental phenomena and adopt their healing principles by the establishment of a department of mental therapeutics in our colleges. If we would do away with patent medicines, let us learn at least the physiological action and dosage of drugs, and the art of prescribing them intelligently without utilizing unphysiological, incompatible, pharmaceutical nostrums.

THE ETIOLOGY OF PELLAGRA IN CHILDREN—A STUDY OF TWO HUNDRED CASES IN ORPHANAGES

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INTRODUCTION

The object of this paper is to consider the data obtained in an epidemiological study of 200 pellagrous children in orphanages. Of these, 182 were in a local institution; the others were observed in another orphanage. The more intensive study was made in the local institution, and covers four epidemics. One hundred and fifty of these children have been under direct observation. The information of about thirty others was obtained through the Head Nurse, who has been in charge fifteen years, and whose experience enables her to recall the disease in these cases. Several of these early cases were reported by Dr. J. W. Babcock, in 1907.[1] Prior to that time no medical records are available of the pellagra cases. In the total number of 245 children, there are now in the Orphanage 150 who have had one or more attacks of pellagra.

The following table gives the distribution of cases according to the year of occurrence. The table gives the number of cases for each year, the new cases and relapses being given in separate rows:

TABLE I.

Year	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15
New cases in newcomers...	1	0	0	0	0	0	1	4	0	2	2	13	1	27	16
New cases in old residents	0	0	0	0	0	0	2	0	2	9	2	19	2	24	26
Recurrences ..	0	0	0	0	0	1	3	2	3	8	6	24	19	27	70
Totals	1	0	0	0	0	9	6	6	5	19	10	56	22	78	112

As will be noted, no cases are reported between 1901 and 1906, though it is more than likely that the disease existed in its mild form unrecognized during those years. During the last three years applicants for admission to the Orphanage have been required to furnish from their family physicians certificates giving their per-

*Read before the Third Triennial Meeting of the National Association for the Study of Pellagra, Columbia, S. C., Oct. 21-22, 1915.

sonal and family histories. On arrival at the Orphanage a thorough examination is made and special efforts are used to determine whether or not the applicant has had a previous attack of pellagra. Of course, this method does not reveal all of the imported cases. A former attack of pellagra was discovered in sixteen instances. From the first of January to the first of June or longer, frequently routine inspections of the entire population were made to detect the earliest evidence of pellagra in the children. In this way the development of new cases and that of recurrences were promptly recognized.

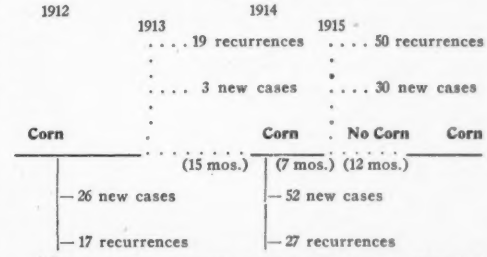
RECURRENCES

The rate of recurrences varied considerably in the different epidemics. Of 47 cases in 1912 which remained in the Orphnage, 20, or 43%, had a recurrence in 1913; of 24 in 1913, there were 16, or 67%, which had recurrence in 1914; and of 74 cases in 1914, 59, or 80%, were again attacked in 1915. September 1, 1915, there were in the Orphanage 60 children who had had one attack, 54 who had had two attacks, 17 three attacks, 10 four attacks, and 3 five attacks. Among those who had escaped one year, there were 19 recurrences; among those who had missed two years, 8 recurrences; among those who had missed three years, 1 recurrence, and of those who had missed 5 years there were 2 recurrences. Hence the escape of three years from an attack seems to make a child practically immune from subsequent recurrences. In the analysis of epidemiological data as well as in the method of obtaining the same, a good deal depends upon the viewpoint of the investigator. Therefore, the writer offers the results of his study simply for whatever value they may have to the student of this protean disease, realizing fully that there are those who may take issue with his method. And no one can be more cognizant of the incompleteness, in many ways, of the data obtained than the writer himself.

MAIZE THEORY

From the outset it was felt that an opportunity presented itself to test the maize theory. For three years previous to 1912 home-grown corn, ground weekly, had been used in the Orphanage dietary. During the Spring of this year 43 cases of pellagra developed in the institution. As a trial the use of all corn products in the diet was suspended in July, 1912. During a period of fifteen months, or until October, 1913, no more corn was allowed. Between these dates 3 new cases and 19 relapses of pellagra occurred. One of the new cases developed in a child two weeks after admission and the other 2 cases possibly were relapses in children in whom a previous attack had been overlooked. However, for reasons of economy, corn was restored to the diet in October, 1913. The following Spring (1914), 52 new cases of pellagra and 27 relapses occurred. These cases developed within six months after the resumption of corn. Again corn was excluded and from May 1, 1914, to May 1, 1915, the children were on a corn-free diet. During this period, ten months after the exclusion of corn, 30 new cases and 50 recurrences developed. (See chart.)

CHART



Showing number of cases in the four epidemics from 1912 to 1915 inclusive, with relation to the use and non-use of corn in the dietary. Dotted lines represent time corn was excluded.

INCUBATION PERIOD

Although these experiments may not be conclusive evidence against the maize theory, the results are significant. The whole question, of course, depends upon the incubation period of pellagra. Sandwith and Merke[2] are disposed to consider this to be between nine and twelve months. Sambon thinks it may be as short as two weeks. There are other authorities, as for example Scheube,[8] who disbelieve in any definite incubation, holding the view that the disease may develop after a long period of ill-defined symptoms. Limiting the discussion for obvious reasons to the new cases occurring among the older resi-

dents, that is, those who had been inmates a longer period than twelve months, there were two groups of cases consisting of 24 each (see Table No. 1). In one group, pellagra developed six months after the resumption of corn. Just prior to that period was the fifteen months of corn-free diet. The other group occurred ten months after the exclusion of corn. If both groups were due to corn, the incubation appears to have varied widely in the two series of cases. In one instance it was within six months; in the other it must have been over ten months, since no corn had been eaten for ten months prior to the appearance of the erythema. This, of course, raises the question as to whether the erythema is to be considered the starting point of the disease. Manifestly in adults such is not the case. In children, however, in the large majority of cases there appear to be no premonitory symptoms and the dermatitis constitutes the only evidence of the disease, a fact well recognized among students of pellagra.

In 42 cases, the length of time from admission to the Orphanage until the first erythema was as follows:

At the end of 8 months, 5 cases;
At the end of 6 months, 15 cases;
At the end of 4 months, 5 cases;
At the end of 3 months, 4 cases;
At the end of 2 months, 7 cases;
At the end of 2 weeks, 6 cases.

These cases would tend to show that the incubation may fall short of six months. As is seen, twenty-nine of these cases had been in the Orphanage more than three months.

PREDISPOSITION

Authorities seem to agree that this is an important factor. Any cause of lowered vitality may furnish the soil suitable for the development of pellagra, just as it does for many other diseases. It may be inherited weakness, poor nourishment, coincident disease, an operative procedure, age, sex, or alcoholism.

1. *Hereditary Weakness.*—The cause of death assigned for one or both parents of 74 children of this series was as follows:

T. B., one parent	10
T. B., both parents	4
Pellagra, one parent	10
Pneumonia, one parent	22
Heart disease, one parent	3
Paralysis, one parent	3
Accident, one parent	9
Other causes	5

Of these parents, 50% died of diseases that transmit lowered resistance. Frequently ill health in the living parent accounts for the presence of the child in the Orphanage. We have here no information of the part possibly played by alcoholism in the cause of death from pneumonia in the parents. In a former paper[3] the opinion was expressed that in orphanages usually we are not dealing with average normal children; that they are not only the victims of inherited disease, but frequently the offspring of poverty and degradation.

2. *Age.*—In the report of the 1912 epi-

TABLE II.

ORPHANAGE INMATES

Years of age	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
No. cases	(0)	3	14	17	17	24	20	26	25	14	9	4	3	3	1	(0	1	1)
									80%						20%			

GENERAL POPULATION

(Thomp. McFad Com. Sec. Prog. Report.)

Years of age	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
No. cases	(12)	13	14	14	16	11	10	10	11	3	10	4	4	3	7	(8	9	9)
									76%						24 %			

MILL POPULATION

(Thomp. McFad Com. Sec. Prog. Report.)

Years of age	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
No. cases	(0)	4	13	3	9	11	6	5	2	2	3	2	4	1	2	(4	3	7)
									79.1%						20.9%			

demic of pellagra in this Orphanage[3] it was observed that 79% of the cases occurred in children under twelve years of age when the disease developed, whereas only 42% of the children then in the Orphanage were under twelve years. In the 1915 epidemic, 65% of the new cases were in children under twelve, whereas only 39% of the inmates were under that age. Table II shows the number of cases that occurred in each year of life from four to nineteen when the first erythema developed.

It is seen that there are no cases under four years, and but two over fifteen. Children under four are not accepted in the Orphanage and but few remain after the sixteenth year, when they are supposed to have completed the school course. From this table we find that of 182 pellagrins, 147, or 80%, developed the disease prior to the twelfth year, while only 35, or 20%, were beyond that age. Of 67 pellagra cases between four and seventeen years of age reported from seven mill villages by the Thompson McFadden Commission,[4] 79% developed their first erythema before the twelfth year. Also of 130 cases in the general population of one county, 99, or 76.1%, developed pellagra before the twelfth year. It is thus seen that the age incidence is practically the same in the general population as in orphanages.

3. *Diet.*—An effort has been made to determine whether this age distribution of our cases might be traced to a difference in the diet of the children. The food for all the inmates is prepared in the same kitchen, but it is served in two dining rooms, one in the upper story and the other in the lower story of the same building. The occupants of the respective rooms are selected according to age and the school grade to which the children belonged, the younger children being assigned to the lower and the older ones to the upper room. Transfers from the lower to the upper room are made as new children, who are usually the younger, enter the Orphanage. The average age of the children on admission has been eight and one-fifth; average age of the appearance of the symptoms of the disease, nine years. It was found that there is a slight difference in the diet of the two dining rooms. In the lower room, where the smaller children eat, practically no meat is allowed except the bacon boiled with the vegetables and a portion of the forty pounds of beef which is supplied for the entire population once a week. The children do not care for the boiled meat, and so in this dining room the small allowance of beef is all the meat eaten. In the upper dining room, in addition to the beef and boiled bacon, a group of the older boys who work on the farm and in the shops, about eight in number, have fried bacon daily for breakfast. One table of the larger girls has the fried bacon less frequently, perhaps three times a week. All of the other children in this room get bacon only occasionally. No other obvious difference exists in the diet of the two rooms. It may be noted that none of the children get more than one small slice of bacon for breakfast. Of the 77 children eating in the lower dining room all were under twelve years of age. In the upper room were 21 children slightly older than those, but also under twelve years. A child who had not been transferred to the upper room as long as twelve months was counted as belonging to the lower room. Of the 77 in the lower room, 68, or 88.5%, have had pellagra, while of the 21 under twelve in the upper room, 18, or 85%, have had the disease. It is seen that the percentage of cases in children under twelve years remains practically the same whether they belong to the upper dining room, where fried bacon was sparingly served, or to the lower dining room, where none was allowed. Of the 151 children in the upper room who are over twelve years, 62, or 41%, have had one attack or more of pellagra. If we take only the children who had an attack in 1915, of the 77 in the lower room, 63, or 83%, were affected, while of the 21 under twelve in the upper room, 14, or 66.6%, had the disease. Of the 151 children in the Orphanage over twelve years of age in 1915, 35, or 23.1%, were affected. Hence from whatever standpoint these cases are studied, the incidence in children under twelve always greatly exceeds that in those over that age in this institution. As will be seen from Table II the greatest number were ten years old when the first erythema developed.

Aside from the difference in the diet above noted, certain other less obvious discrepancies seem to enter into the actual consumption of the food by the respective classes. The larger girls assist in the cooking and serving of the meals and the larger boys do the milking. From sixteen to twenty girls and an equal number of the boys are thus engaged. The girls work in sets, one set being on duty for a month at a time, and in the course of a year practically all of the larger girls have from two to three months' service in the kitchen or dining room. The boys who do the milking rotate less frequently. There is no doubt that the girls do appropriate the food; or "hook" it, as they say, for themselves and for their friends who happen not to be on duty at the same time. The boys are known to drink of the milk also before it is delivered to the kitchen. It is thus seen that practically all the larger children have an advantage over the smaller in that respect. What part these factors play in the unequal distribution of the food or in the age incidence of the pellagra cases is, of course, problematic. Though it was noted during the first general inspection of the children at the beginning of the 1915 epidemic that a very large proportion of them were in a low nutritional state, it was not apparent that the smaller children were in a worse condition than the larger ones. Moreover, as already pointed out, the Thompson McFadden Commission, investigating pellagra in the private home, also found the same higher incidence of the disease in the smaller children. As yet no evidence has been brought forward to show a difference in the feeding of the small and large children in the home.

It must be admitted, however, that in the general dietary of this Orphanage, as well as in that of other similar institutions, there is consumed an excess of the less expensive carbohydrate foods, while the more expensive protein animal foods are supplied in conspicuously small amounts. The exact proportion of the several classes of foods could not be ascertained. For the last four years the quantity of meat per capita per day consumed in this institution has been less than 1 1-11 oz., while 1-3 pint of milk per capita per day for all purposes would be an outside figure. And it must be observed here that three-fourths of this 1 1-11 oz. of meat was salt pork, which contains only a small per cent of proteins. A considerable portion of the milk is used for cooking and the sick children and adult workers get a larger share than the others, which reduces the allowance for the other inmates practically to a negligible quantity. The report of the Illinois Pellagra Commission[5] on the dietary of various state hospitals showed that the largest consumption of meat in any of these institutions averaged 10.65 oz. per capita per day, which was considered by the Commission to be below the quantity desirable. Yet it is *nine times* as much as is usually consumed in this Orpranage. It was noted by the Commission that, following a reduction in the amount of meat in certain of the hospitals, there was an increase in the number of cases of pellagra, whereas, in some institutions an increase in the meat constituent of the diet resulted in a reduction in the amount of pellagra. Inquiry was made of three other orphanages in South Carolina as to the total quantities of the different constituents of the diet furnished their inmates. Each of the three institutions reported the occurrence of but one case of pellagra for 1915. In one of these orphanages the average amount of meat and milk consumed per capita is twice as much as in the institution under discussion. In another the milk consumed is double the quantity allowed in this Orphanage, and in other respects the diet seems to be more liberal. In the third orphanage the per capita consumption of milk is about the same, but twice as much meat is supplied and a more varied diet obtains. It may also be mentioned in this connection that the evidence seems to show that the quantity of meat and milk consumed in the local Orphanage under discussion for the last several years has not been increased in proportion to the increase in the population. This applies also to the allowance of peas and beans consumed. Moreover, the Orphanage depends upon its own farm for the supply of these legumes, and the crop has been shorter than usual for the past few years. It is to be hoped that from this agitation of the question of the proper feeding of children in orphanages

may result a standardization of the dietary of such institutions. The per capita consumption of meat and milk was computed from the total amounts of these articles furnished for a year by the several orphanages.

4. *Sex.*—Of 200 cases of pellagra, 92 were females and 108 males. In the local Orphanage of 182 pellagrins, 83 were females and 99 males. During the 1915 epidemic, of 129 females in the institution, 40, or 31%, were affected, while of 112 male inmates 72, or 64.2%, had the disease. In the children under twelve years of age, of 43 *females*, 21, or 48.3%, had pellagra, and of 63 males, 55, or 87.3%, were affected. In the children over twelve years of age, of 86 females 19, or 22%, were affected during the epidemic of 1915, while of the 49 males in the institution over twelve years, 17, or 32.6%, had pellagra. In other words, the incidence in children under twelve years was nearly twice as high in males as in females; whereas in children over twelve it was one and one-half times as high in the males during the 1915 epidemic. The relative decrease in males after the twelfth year of age is due to the fact that a greater proportion of the boys than of the girls leave the orphanage before the completion of the school course. This disparity in sex incidence possibly is susceptible of various explanations. It may be contended that the large girls are better nourished than the large boys owing to their opportunities to help themselves to the food while serving the meals, yet the smaller girls who are not thus favored also show a lower incidence than the smaller boys. As observed above, certain proportion of the larger boys do the milking and so have opportunity to drink some of it on the sly.

A rather significant observation throughout the several epidemics of pellagra has been the prevalence of an unusual amount of superficial infections among the children such as ophthalmia, furunculosis, and infection of minor wounds. These disturbances are well known attendants of poor nutrition and uncleanly habits. If disobedience of the laws of hygiene is at all a factor in pellagra, the small boys' chances of contracting it are notoriously enhanced. In view of the fact that the skin lesions often are the only manifestation of the disease in children, it may be that the erythema occurs more frequently in the boys because of their greater exposure to the sun in out-of-door games and on the farm. So that the disproportion in the sexes may be more apparent than real. In barefooted children the rash often occurs only upon the dorsa of the feet and calves of the legs. In the children wearing shoes the year round, these parts are rarely ever affected, the erythema being confined to the backs of the hands and forearms for the most part. These facts may help to account for the greater recognizable incidence of pellagra in the younger children who compose the barefoot class.

5. *Coincident Diseases.* — The occurrence of other diseases in children may not only add to the gravity of pellagra, but may be the exciting cause of the latter disease. During the course of an attack of typhoid fever, pnuemonia or other infections, a patient may exhibit for the first time the pellagrous syndrome. The one death in the last 150 cases of pellagra in this Orphanage was that of a child who developed uremia during an attack of mumps. No evidence of pellagra had been found until after urinary suppression had existed several days when the classical picture flared up,—erythema, sore mouth, diarrhea, vulvo-vaginitis, proctitis and mental involvement. In several of our cases pneumonia was complicated by the pellagrous syndrome. The writer knows of two deaths that occurred outside of the Orphanage in which pellagra complicated typhoid fever in children under three years of age. In both cases a positive Widal was obtained; and in neither child had any evidence of pellagra been discovered prior to the typhoid attack.

6. *Immunity in Pellagra.*—(a) Reference to Table III will show that of 166 cases of pellagra, 78, or 47%, developed in newcomers during the first year's residence at the Orphanage; 23, or 13%, in the second year; 25, or 14%, in the third year; and 17, or 10%, in the fourth year; and 23 in subsequent years.

TABLE III.
(Garrison, So. Med. Jr. 8-15)

ORPHANAGE			HOME		
1st yr. Res.....	78	47%	1st yr. Res.....	46	52.5%
2nd yr. Res.....	23	13%	2nd yr. Res.....	24	27.2%
3rd yr. Res.....	25	14%	3rd yr. Res.....	10	11 %
4th yr. Res.....	17	10%	4th yr. Res.....		
Subs. yrs.	23	16%	Subs. yrs.	8	9 %

In other words, 60% of the cases occurred during the first two years' residence in the Orphanage. Our experience leads to the belief that the greater incidence in the first year's residence is not due solely to cases unrecognized on admission to the Orphanage. It was found by the Thompson McFadden Commission[4] (also see Table III) that of 88 secondary cases in the home, 46, or 52.5%, developed within the first year after association with the primary cases began, and that during the second year, 24 other cases developed, or a total of 70 cases, or 89%, for the first two years' exposure to the primary case; while in subsequent years the incidence fell rapidly. It was frequently observed in our study that entire families of the newcomers would develop the disease during the first epidemic following admission to the Orphanage, whereas in a given epidemic perhaps but a single case would occur in a family of old residents who had not previously been affected. For comparison nine families representing each class were selected. In the nine families of old residents who had been at the Orphanage an average of four years and containing 36 children, 9, or 25%, developed their first erythema during the epidemic of 1914. In the nine families of the newcomers consisting of 37 children, 31, or 87%, had shown evidence of pellagra during the first year's residence. Five of these are known to have had pellagra on admission, which reduces the incidence for the first year to 70% as against 25% in those with an average residence of four years.

(b) It is a well established observation that certain epidemic diseases are characterized by greater virulence when first introduced into a given territory. When measles first invaded the Fiji Islands,[7] 40,000 out of a population of 150,000 died of the disease within four months. In the widespread epidemic of influenza in the United States in 1889, after its absence for a generation, the type was much severer than that of recent years. Many other known infections also exhibit this phenomenon. The three deaths from pellagra that have occurred in this Orphanage were of the first 30 cases. Several of the early cases were of the wet type, whereas none of the last 150 cases has been at all severe. Of 150 cases of pellagra reported from 14 orphanages in the South in 1912, six resulted fatally, all of them among the first 70 cases that had occurred in these institutions. These facts remain unexplained if diet is the sole cause of pellagra. In the particular Orphanage under discussion, until quite recently no improvement in diet has been coincident with the absence of fatalities. (Since September, 1915, this Orphanage has been under the direction of the United States Public Health Service for the eradication of pellagra by dietary measures.)

7. *Sanitary Conditions.*—Until the Fall of 1914, the unscreened surface privy was in use at this Orphanage. Following a small epidemic of typhoid fever of that Summer, a complete water carriage sewage system was installed. It became operative in November, four months prior to the epidemic of pellagra of 1915. Although the time has been too short to justify definite conclusions, the occurrence of 60 cases of pellagra by March 8 of this year, before the appearance of flies, mosquitos or gnats, lends no support to the theory that these insects are carriers of the disease. In the epidemic of 1912, it was ascertained that 70 children showing no symptoms of pellagra had slept with pellagrins during the preceding year. To this extent, at least, the indictment against the bedbug is unsustained!

Although the occurrence of pellagra in orphanages seems to be connected in some way with a deficiency in the amount of animal food in the diet, the wide variation in the proportion of the two principal articles,—meat and milk,—consumed by the inmates of the several institutions investigated as above mentioned tends to show that the fault is not necessarily confined to a lack of either milk or meat alone. In other words, an adequate increase in the amount of milk or meat or of both would be a sufficient correction of the diet-

ary. Possibly both meat and milk contain the all important "vitamines." But whatever may be the relation of diet to the causation of pellagra in children, it must be admitted that the disease frequently develops in the apparently well nourished child, though the symptoms in these cases are mild and of short duration. The typical erythema may occur without any premonitory signs observable and passes through regular stages to the desquamation; the exfoliated surface is left smoother and of a lighter color than the unaffected adjoining skin. Ultimately the normal consistency and color of the skin are restored. There may be a mild stomatitis and diarrhea, but more often the skin lesions are the only evidence of the malady. The same phenomena may recur for several seasons or not at all, though the child remains apparently on the same diet and in the same surroundings. That these children may be as well nourished as their non-pellagrous mates was shown in a former report.[3] A group of 29 pellagrins and another group of 29 non-pellagrins of the same age and height were found to be of equal weight, while physically, in other respects, both groups appeared equally healthy. Of course there is the possibility that in such a mild type of the disease we may have many cases of near-pellagra unrecognized.

Along with these extremely mild cases, however, others develop that pursue an entirely different course. In a child of lowered resistance from hookworm, tuberculosis, syphilis, or hypo-nutrition from any cause, the disease is ushered in by the typical erythema. But, instead of a transitory dermatitis only, we have in addition alimentary disturbances, — sore mouth, indigestion, diarrhea,—with mental hebetude or exceptionally mental alienation. These symptoms may remit several times during the year. Finally an atrophic parchment-like condition of the affected skin remains. The tongue is bald and fissured, the reflexes diminished or lost, the mind sluggish and a mild cachexia ensues which persists from year to year. The victim, stunted in mind and body, is never bed-ridden yet always below par, and the question naturally arises as to whether the pellagra is the effect or the cause of the lowered nutritioned state. Viewing these observations in their broader significance, it is possible that the field of sociological endeavor is thus further extended; for the bearing of the problem of pellagra in childhood upon the subsequent development of the individual is a subject of great vital importance that demands the attention of all who are interested in the future welfare of the race. Perhaps 10% of these 200 cases of pellagra belongs to the chronic type that probably will leave its stigmata upon the victims throughout life.

SUMMARY

1. The facts in a large per cent. of the cases of pellagra in this Orphanage strongly discredit an essentially causative relation of corn.

2. The incidence of pellagra is much higher in children under twelve years of age. The differences discovered in the diet of the smaller and larger children seem inadequate to account for this age distribution.

3. Children are more than three times as liable to develop pellagra during the first year's residence in the Orphanage as in any subsequent year.

4. There appears to be some relation between the amount of animal food consumed and the spread of pellagra in orphanages.

5. The predisposing factors: age, sex, hereditary weakness, poor nutrition and coincident diseases, apparently were operative in this series of cases.

6. There was no evidence pointing to unsanitary conditions or to the insects as a cause of the spread of the disease.

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PELLAGRA IN CHARLESTON, S. C.*

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INTRODUCTION

Charleston lies on a peninsular ten to twelve miles in length and eight to ten feet above the sea level, between the Ashley and Cooper Rivers. These rivers are salt throughout that part of their course contiguous to the City and merge to form an excellent harbor.

It is one of the largest and most important seaports on the South Atlantic Coast, and is one of the oldest in this country, having been settled in 1670 by the English.

The climate is subtropical. The annual average temperature is 65.6° F. The average humidity is about seventy-eight per cent; and the annual rainfall about fifty-two inches.

The antiquity of the City probably accounts for its lack of symmetry of construction. The plan was apparently that of right angles, but numerous cross streets have tended to divide it into irregular blocks which have made possible the development of many small alleys and courts, the significance of which has considerable bearing upon the great density of its population.

The City is surrounded by a number of sea islands. Its back country is low, and there is considerable area of marsh lands. Most of this territory is quite fertile and peculiarly adapted to agriculture. There are many large truck farms in this section where Negro labor is chiefly employed.

According to the United States census of 1910, Charleston has a population of 58,833. Of these, 27,764 are white, and 31,056 are Negroes. The total number of males is 27,334 and of females is 31,499. There are 13,607 white males and 13,714 colored males. The females are divided into 14,157 white and 17,342 colored. Of the total white population but 1,282 are foreign born. All the Negroes are natives of this country and nearly all of this State. It is an interesting fact that the males number nearly the same and that the excess of the blacks over the whites is made up by the females, there being more than 3,000 Negro females than white.

During the past semi-decade the City's population has an estimated increase of about 3,500,—mostly white. It is probable that there has been a decrease in the Negro population. During the preceding ten years there was a loss of 4,279 blacks in this county. A reference to the earlier census reports would seem to show that the white element is on the increase while the reverse is true with the black.

Charleston is one of the most congested cities of the South, having, according to one of the latest census reports, 15,500 to the square mile. There are approximately 9,700 dwellings and some 15,000 or 16,000 families.

The great density is due to the large Negro population which is distributed among the small alleys with which the City abounds. It has been said that "a Negro takes to an alley as a martin to a gourd." The reason is obvious: he obtains cheap rental and is in close association with his fellows.

The alleys are made up chiefly of frame structures closely approximated, the apparent object being to crowd in as many rooms as possible in order to increase the income therefrom. A census was taken of some of these alleys. In one, about large enough for the building of two fair sized dwellings, we found fifteen families numbering fifty-six individuals. In another, perhaps a little but not a great deal larger, there were forty-four families comprising ninety-one people. In still another of about the same proportions in which there were forty rooms, there were thirty-one families, or ninety-six persons in all. This, however, is the worst type of alley, but unfortunately is found all over the City. The last two were in very desirable residential portions. The better type of alley is illustrated by one in which we found ten dwellings and ten families, there being thirty-two inhabitants. Even this last, considering the area taken up, was entirely too congested and contributes to the high density.

*Read before the National Association for the Study of Pellagra, Columbia, S. C., Nov., 1915.

It is rather rare to find the whites so closely congested. There are only a few places in which this condition exists. In a combination apartment house occupying an area which would accommodate two or three good dwellings we found nineteen families, or seventy-six individuals.

The City has been rather late in establishing an efficient sewerage system. In 1895, sewers were laid in the lower quarter of the City; prior to which time it was dependent upon a rather inadequate tidal system of gravity drainage. In 1911, work was begun again, and up to the present, except for an area in the northeastern section of the City, the town is entirely sewered. All the property owners are being forced to make connections; and in the sewered portion of the City there are comparatively few vaults and surface privies remaining, whereas in the unsewered area these latter are still in use.

The method of garbage disposal now in vogue is quite ancient. A large tract of land in the northeastern section is being reclaimed by the waste of the City. This area, commonly known as "the Dump," receives the City's daily accumulation of refuse, filth and carrion. In time this makes perfectly good land, but while in the making it is the camping ground of the buzzard and an excellent breeding place for flies and mosquitoes.

The fact that Charleston has so large a Negro population and that it is scattered throughout the City, is in itself evidence of bad sanitation. The Negro is notoriously dirty in his habits, is careless as regards those about him and is ignorant as to propagation of disease.

Considering these things, and the fact that the domestic servants are supplied from these dirty and overcrowded sources, the Negro becomes a very serious sanitary problem.

Add to the unhygienic status of the Negro the incompleted sewerage system and the inadequate method of garbage disposal, and we have factors which tend to produce a high rate of morbidity and mortality.

It should be emphasized, however, that in this City the high rate is due largely to the Negro, as the sickness and death among the whites is no higher than in other communities which do not have this incumbrance.

This brief description of the sanitary situation in this City would seem to justify the existence of pellagra here if unsanitary conditions have any bearing upon the epidemiology of this disease. These conditions undoubtedly influence the production of certain infectious diseases which are more or less endemic in this area. Among these may be mentioned malaria, typhoid, the dysenteries, filariasis, leprosy and occasionally smallpox. Beri-beri is not uncommon, and infection with intestinal parasites, e. g., hookworm, ascaris and trichomonas, is frequent.

LOCAL HISTORY OF PELLAGRA

We are convinced that pellagra has occurred in Charleston for many years unrecognized. It is probable, though, that its occurrence has been only sporadic and its identity confused with such diseases as syphilis, eczema and scorbutus.

A careful search through the mortality records of this City from 1822, shows no deaths due to this disease prior to 1908. As early as 1824, one death was reported from scurvy; there was one again in 1836, and one in 1837. These three deaths were in Negroes. In December, 1883, there was a Negro death from eczema and again in March, 1888. There is a white death recorded in 1890 from eczema rubrum, and two more whites in May and July, respectively, 1891, from eczema. There is still another in December of 1900, and in November, 1905, one white from eczema pustulosum. It is of course problematic whether any significance can be attached to these records. Scurvy, apparently a rather common affection in the early part of the nineteenth century, might easily have been the true cause of death, although it is entirely possible that the conditions may have been mistaken as the old practitioners seemed to apply the term "scorbutic" so widely and sometimes rather vaguely to cover many conditions somewhat allied to the real disease. For this reason it takes no stretch of the imagination to have it comprehend the syndrome now known to be pellagra. Eczema practically never kills. To produce death a more potent cause was acting. The cutaneous evidence of the disease being most

manifest, the deaths were ascribed to it; the true cause was overlooked. Especially in the white cases diagnosed as eczema rubrum does this seem probable. Although a search has been made through much of the old medical literature of the City, nothing suggestive of the disease has been unearthed. Inquiry among the older practitioners, however, seems to show that pellagra occurred occasionally in their practice. It was no doubt rare. Some had never seen anything like it.

One of the gentlemen, who has been in active practice for more than a half century, now recognizes in retrospect as pellagra certain cases which he called eczema and which he at the time attributed to the filth and squalor of the patients' surroundings. It was not a common occurrence.

One other gentleman, not so long in practice but who saw a large number of patients daily in the free ward of the hospital, states that he probably saw the condition occasionally, but feels sure that if it had occurred with the frequency now prevailing he would undoubtedly have suspected some other entity than eczema. Moreover, a few of our records show that the first attack occurred many years before the disease had become generally recognized in South Carolina. Two especially reliable ones give accounts of outbreaks in 1893 and 1894. In May, 1887, a white woman from Charleston was committed to the State Hospital for the Insane, dying there in 1891 from "inanition." This woman had a peculiar mania for eating starch (amylophagia). Dr. Babcock now believes that this was an undoubted case of pellagra.[1]

A young Mulatto woman who died there in 1904 with dermatitis exfoliativa also came from Charleston. She, according to the same authority had a universal type of the disease.[1]

Dr. T. P. Whaley states that he saw three cases of the disease in Charleston in 1897. They were Negroes from Johns Island. He called the condition pellagroid.

The first case offiicially reported as occurring in Charleston was in March, 1908, subsequent to Babcock's startling announcement of the presence of the disease in the State Hospital at Columbia. This information was obtained through a report to the United States Public Health Service by Dr. F. F. Sams, then Acting Assistant Surgeon.[2] We have, however, not been able to secure an accurate record of this case. The first death was reported in September, 1908, by Dr. J. S. Rhame, then an interne at a local hospital.

It would thus appear that pellagra is not a new disease in Charleston. Although our data is quite meager and lacks much definite detail, it would nevertheless seem to warrant the conclusion that pellagra has been present unrecognized for many years. However, it would also seem to indicate that the disease was only sporadic, never attaining the high incidence now prevailing.

STATISTICAL STUDIES

We have records of 361 cases of pellagra occurring in the City up to the end of 1914. Of these, 96 were white and 265 Negroes. This data as to racial difference is interesting in view of the fact that it is the reverse of the findings of the Thompson-McFadden Commission. The ratio of whites to Negroes as found by them was 1 to 3. To a certain extent conditions are reversed; in Spartanburg County about one-third of the entire population resides in the mill villages. They are congested and live under unhygienic conditions. It is much the same with the Negro here; he is overcrowded and lives in the most unsanitary environment. This would seem to explain the remarkable difference; but as a matter of fact the large morbidity and mortality list of Charleston is swollen by the influx of cases from the outlying districts and sea islands. These areas have not been closely studied, but are reported by physicians with suburban practices. And not infrequently the history of a previous residence shows in a fair proportion of cases the origin of the disease to be in certain of the small near-by farms and villages. However, it must not be forgotten that despite the open country the Negro frequently is congested; for at least throughout this section, it is common to see the little one- and two-room cottages clustered in such a manner as almost to equal in density of population that of the same area in the City.

Of the white pellagrins in this series, 26

came from the better walks of life. The majority is made up of the poor class of whites who live under conditions little better than the Negro.

A spot map of the cases in this City would seem to show that the disease is more prevalent in the more unhygienic sections than in those in which the better conditions prevail. There is no section of the City, however, that the disease has not invaded at least to some extent.

The sex distribution of this series bears out that usually noted, namely, a preponderance of females. Our records show 121 males to 240 females affected. Of the males there were 44 whites and 78 Negroes; of the females 57 whites and 182 Negroes.

The age was not ascertained completely except under our mortality observations. We found, however, 8 cases 5 years of age and under. They were distributed as follows: One 1 year, two 1½ years, three 2 years, one 4½ years and one 5 years of age.

MORTALITY

The mortality record for Charleston shows a total of 251 deaths from pellagra from 1908 to 1914, inclusive. Of this number 47 were white, 204 Negroes,—a ratio of about 1 to 4.

These deaths are distributed according to sex as follows:

Males	68	Females	183
White males	13	Colored males	55
White females	34	Colored females	149

It was not found practicable to compute the annual incidence of pellagra from the total cases tabulated because of certain unavoidable difficulties. But a study of the mortality shows a progressive increase of the disease from 1908 to 1915.

	White Per 100,000	Colored Per 100,000
1908—	1— 3.5	4— 12.8
1909—	1— 3.5	8— 25.6
1910—	5—17.6	12— 38.4
1911—	8—28.2	23— 74.0
1912—	5—17.6	43—138.8
1913—	10—35.3	46—148.0
1914—	17—60.0	168—219.6
1915—	15—52.5	123—393.6

Note.—1915 not included in race and sex tabulation, added subsequent to reading of this paper.

The tabulation of the mortality by age shows a preponderance of deaths in the third and fourth decades and among the colored females. The table following takes up the distribution by age and sex:

Ages.	1-10	20	30	40	50	60	70	80	90	100
White—										
Males	1	1	1	1	1	3	2	3	—	—
Females	1	—	2	6	6	6	6	1	—	—
Totals	2	1	3	7	7	9	8	4	—	—
Colored—										
Males	6	6	7	10	11	7	4	4	—	—
Females	7	6	37	41	28	20	12	4	—	—
Totals	13	12	44	51	39	27	16	8	—	—

Unfortunately our mortality statistics are very much higher than our morbidity series would seem to justify. The reason is obvious. The death record is easily accessible, whereas the sources of error in the collection of our reports is dependent upon so many uncertain factors. We feel that our total number of cases is much too low. This is due to our inability to obtain complete reports from the physicians; to the fact that many cases are sent away for mental treatment before the diagnosis is clear; and also because of the prevalence of certain mild types which do not come under observation. On the other hand, both the mortality and morbidity figures for the City *per se* are undoubtedly modified by the frequent ingress of pellagrins from the outlying rural communities, who come in for hospital treatment.

The colored physicians of this section, who are, on the whole, quite intelligent and observant, have told us of the marked prevalence of the disease among the colored population of the surrounding country districts. One of them informs us that in St. Andrew's Parish, a section of the mainland across the Ashley River, the ravages of the disease are fearful. He is, however, not able to give figures.

There is another section where the disease prevails extensively and furnishes not a few of the deaths recorded against

Charleston. This place is Johns Island, about ten miles from the City. Several physicians tell us that all of their pellagra cases are Negroes from Johns Island. Complete figures have not been obtained, but we are certain of no less than twenty in our series originated there. This Island was visited by Dr. Sanbon when in this section and it was here, because of his failure to find the simulium, that he first began to see the weakness of his famous theory.

Admitting the probability that the high incidence of pellagra in Charleston is influenced by introduction of cases from outside sources, we feel, nevertheless, that our data is sufficient to prove that this City is in itself an original focus. Out of our series of 361 cases, our records show approximately sixty which we are certain developed within the corporate limits of the City. Of these, three have occurred in infants of 1, 1½ and 2 years, respectively. For these reasons we feel that pellagra is endemic in Charleston and that from this data we can refute the statement of the essential rural origin of this disease.

SUMMARY

A summary of this study would seem to show:

1. That pellagra has occurred sporadically in Charleston for many years; that this is an endemic focus; and that the disease is steadily on the increase in this City;

2. That the morbidity is much higher in the Negro, in this section at least, than in the whites, and in females is higher than in males, more especially in Negro females;

3. That bad hygienic and overcrowded conditions play some part in the propagation and spread of this disease, though just how we are at present not prepared to say.

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THE DIAGNOSIS OF CUTANEOUS CANCER

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The diagnosis of skin cancer is not always an easy task, especially as the laity are now beginning to seek advice at a much earlier period than formerly. In making a diagnosis of such growths it is first essential to differentiate the disease from other conditions that may simulate malignancy, and then accurately to ascertain the variety of cancer, for various types act in radically different ways, as both Bloodgood[1] and the writer[2] have emphasized.

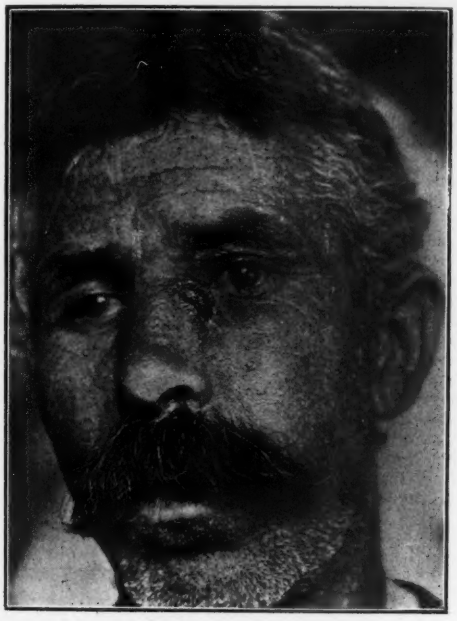
Primary skin cancers may be simulated by syphilis, either primary or tertiary, tuberculosis, blastomycosis, simple inflammation, granuloma pyogenicum, morphoea, depressed scars, subcutaneous nodules, precancerous conditions and vegetating dermatitis.

A chancre, especially an extragenital one, may closely simulate malignancy, because both have marked infiltrated edges. However, in the vast majority of instances a primary sclerosis develops much more rapidly, and is speedily followed by enlargement of the adjacent lymph nodes. Younger persons are usually affected by lues than by cancer. The secondary manifestations usually follow within six weeks, but may not appear until a much later date, so too much reliance should not be placed upon their absence. Various laboratory tests are often of extreme importance in making a definite and prompt diagnosis, as will be pointed out later. In certain instances it is permissable to try the therapeutic test, that is, the effect of one or two intravenous injections of salvarsan, for this remedy will cause the prompt disappearance of a primary lesion, but will not affect an epithelioma.

The nodular lesions of late syphilis may occasionally cause trouble. In the case of

a typical ulcerated gumma the rapid evolution of the lesion and the lack of induration of the edges will make the diagnosis easy, even if other signs of syphilis are lacking. However, at times the growth is very slow and there may be marked hardness at the periphery, and then we may be forced to rely upon the laboratory for aid. The following cases will show the difficulty of making a diagnosis upon one examination alone:

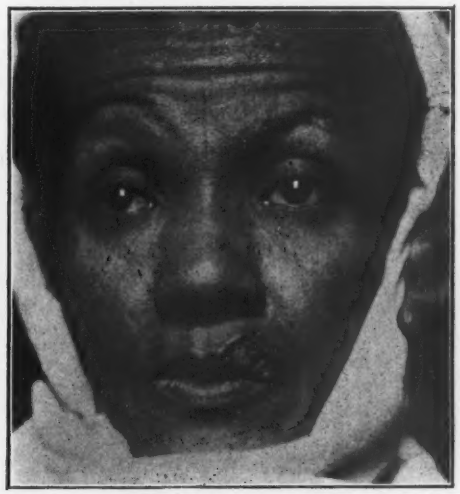
Case 1.—A Negro male, aged 43, entered my service at Freedmen's Hospital because of a growth upon his nose, which had been present for about six months. Examination showed a markedly infiltrated nodule about two cm. in diameter situated upon the left side of the nose. The border was uniformly raised and stony hard;



Case I

the center was depressed and covered with a thick crust, beneath which was granulation tissue that bled rather easily. Further examination showed that the posterior cervical lymph glands were considerably enlarged, even for a Negro. Other signs of syphilis were then searched for, and the left testicle was found to be greatly enlarged. The Wassermann was strongly positive. One injection of neosalvarsan caused the prompt disappearance of a lesion that was clinically typical cancer.

Case 2.—A Negro female, aged 40, came to the Dermatological Dispensary of Freedmen's Hospital because of a lesion upon her upper lip that had been present for seven months. Her husband was under treatment for pulmonary tuberculosis. She gave a history of one miscarriage and of some vague arthritic pains. Examination showed that upon the left side of her upper lip, involving both the skin and the vermillion surface, there was a nodular lesion about two and one-half cm. in diameter. The edge was uniformly raised and hard and the center was depressed and not ulcerated. The lesion closely re-



CASE II

sembled a rolled edge rodent ulcer. The Wassermann was negative. Because of the rarity of basal celled cancer in Negroes, and because of the history, a tentative diagnosis of syphilis was made and the patient was put upon intramuscular injections of mercury, with the result that in three weeks the lesion had practically disappeared.

Case 3.—A white man, aged 47, consulted me because of a diseased area back of his right ear, which lesion had been present for about four years, and for which he had been almost constantly treated for syphilis, but without result. Examination revealed a serpiginous area about three inches in diameter, involving both the scalp and the glabrous skin of the neck, the center of which was scar tissue and the edge composed of firm reddish nodules. Closer examination showed that there were a few pearly nodules, so characteristic of cancer. As there was but little infiltration, it was evident that the lesion was a cicatrizing basal called epithelioma. Under two massive doses of the Roentgen rays all active signs of the disease disappeared, and at present, one year later, there has been no recurrence.

Tuberculous lesions should not confuse the physician, although they often do. The lesions of the tuberculosis verrucosa cutis frequently begin upon the hands, are soft and warty in character, and are distinctly inflammatory, with no deep infiltration. They do not start in precancerous dermatoses, and are more apt to affect the young than the old or middle aged. The lesions of lupus vulgaris likewise do not have their origin in precancerous lesions, and rarely commence in one past twenty years of age. The edges usually ulcerate and present shallow ulcers with overhanging edges of skin: there are no cancer nodules and no deep infiltration. Laboratory findings may be of value and may be confusing. It must always be remembered that cancer may develop upon a lupus base.[3]

Early basal celled cancer, showing crust and elevated, pearly nodules at the periphery.

Blastomycosis should not cause trouble, except in such exceptional instances as that reported by Howard Fox,[4] for in this disease the edge is not hard, and there is no deep infiltration. In the old standing cases the lesions are very apt to be multiple. The finding of the causal organism is of great importance. Cancer may develop upon the old lesions of this disease, as Bloodgood[5] has shown.

Simple inflammatory growths are not usually mentioned as causing difficulty in diagnosis, but in several instances have completely misled the writer.

Case 4.—A white woman, aged 45, came to the Dispensary because of a lesion upon her right cheek that had been present for a year. Examination revealed a superficial crust that covered an ulcerated, indurated area, about six mm. in diameter. The edges were slightly elevated, but there were no distinct pearly nodules. A probable diagnosis of basal celled neoplasm was made and the lesion excised. Pathological examination revealed the presence of a chronic inflammatory process, with no signs of malignancy. One year later the condition recurred and was again excised, with the identical histological findings.

I have seen two other cases in which simple inflammatory nodules were mistaken for epithelioma, but in which no recurrence took place. One case, however, was serious.

Case 5.—A Negro female, aged 42, was admitted to the surgical wards of the Freedmen's Hospital because of a lump in her right groin. She stated that one year before she had a wart-like growth excised from the ball of the right foot, and that shortly afterward she noticed "waxen kernals" in the groin of the same side. The local growth promptly recurred and the glands continued to enlarge. Examination revealed the presence of a flattened warty growth upon the sole of the foot. It was not inflamed, the edge was not indurated, nor were there any pearly nodules. Both the femoral and inguinal glands were greatly enlarged and the overlying skin was red and thin. A diagnosis of spino-celled carcinoma with metastases to the glands was made. The case was considered inoperable by the surgeons who first saw her, inasmuch as there were signs that pointed to involvement of the pelvic glands. Later, however, Dr. William A. Jack, Jr., excised the local growth with the actual cautery, and did a complete block operation for both sets of glands. Much to our surprise a very careful pathological examination showed simply a subacute inflammatory process and no signs of malignancy.

It is possible that some of the "cured cases" of cancer, which have not been confirmed by pathological examination, belong to this category. This case also illustrates the fact that some of the so-called inoperable cases of cancer should be given a chance and not denied the benefit of an operation.

Granuloma pyogenicum, well described by both Wile[6] and Sutton,[7] is simply an overgrowth of granulation tissue upon the basis of a superficial infection. The pedunculated aspect, the resemblance to granulation tissue, and the lack of infiltration at the base, should serve to dis-

tinguish this condition from a malignant one.

Morphoea certainly does not resemble an ordinary skin cancer, but there is one type of cutaneous neoplasm that does resemble this condition,—namely, the morphoea-like epithelioma, that has been described by Danlos,[8] Hartzell,[9] Heidingsfeld[10] and others. The center of the lesion consists of a violaceous scar tissue, but the edge is usually a bit elevated and indurated, and may show a few cancer nodules. Ulcerations frequently occur, and it is not improbable that certain of the cases that have been described under the name ulcerating morphoea were really examples of this type of malignancy.

A depressed scar may be simulated by basal celled cancer, as is illustrated by the following instance:

Case 6.—A white woman, aged 43, came to the Dispensary complaining of a hard spot upon her cheek, which had been present for about a year. Examination showed the presence of a depressed area about one cm. in diameter, covered by slightly atrophic epidermis, that was slightly lighter in color than the surrounding skin. The edge was not elevated, nor were any dilated blood vessels present. The depressed skin was closely adherent to an underlying induration in the corium. This induration extended slightly beyond the depressed area, but was superficial, feeling like "a coin imbedded in chamois." The lesion was excised; and microscopical examination showed it to be a basal celled epithelioma.

Subcutaneous nodules may be very difficult to diagnose. Such a growth may be fibrous in character, an area of inflammation in the glands or around a hair follicle, a cystic tumor of the sweat or sebaceous apparatus, or a beginning malignant neoplasm. Long duration, a globular shape and lack of attachment speak against malignancy, but it must again be remembered that a benign nodule may later become malignant. The best way to make the diagnosis is to excise the entire lesion and examine it histologically.

Various of the precancerous lesions may change so insidiously that it is clinically impossible to tell when such transformation occurs. As Sutton[11] has well pointed out, the sebaceous or senile warts, especially the keratoid variety, are very prone to malignant change. As an example of how difficult it is to tell when such change takes place, the following case may be quoted:

Case 7.—A white woman, aged 58, consulted me because of three keratoid lesions upon her cheeks. Clinically none of them showed any of the usual criteria of malignancy, namely, induration and ulceration. All were excised, and one showed the development of a typical basal celled carcinoma.

In passing I should like to call attention to the fact that in a study of forty cases of epithelioma of the face originating in senile keratoses I have encountered but three instances of spino-celled neoplasms.[12] However, cancer of the hands springing from such lesions is usually of the more malignant type.

Cutaneous horns frequently become cancerous, although the onset may be very insidious, and the same is true of most of the other benign lesions, especially scars, ulcers, etc.

Vegetating dermatitis[13] of the type secondary to the discharge from an ulcer or other oozing surface, should not be confused with cancer, for the surface is more regularly verrucose, and not friable, and there is no hard induration.

Malignant moles are supposed to be very easy to diagnose, but occasionally they may be simulated by other conditions.

Case 8.—A trained nurse, aged 22, came to me because of a small tumor upon her leg. She stated that she had been vaccinated a number of years before and that subsequent infection had left a large scar. For several years there had been a flat, slightly pigmented "mole" just at the edge of the scar. About a month before consulting me this had begun to enlarge rather rapidly, and had become much more deeply pigmented. Examination revealed a large vaccination scar on the outer side of the left thigh. Just at the upper edge of this was a protruding globular growth about eight mm. in diameter, and almost black in color. It was firm in consistency and was adherent to the underlying corium, which, however, was not infiltrated. A number of small blood vessels radiated out from it. A probable diagnosis of malignant mole was made and the lesion was excised with a wide margin. Pathological examination showed a small hemangioma, into the interstitial tissues of which hemorrhage had occurred, with the deposit of pigment.

In making the clinical diagnosis of cancer of the skin we must be governed by several factors. In the first place cancer

always develops from some pre-existing lesion, so the history of a precancerous lesion is very important. Ulceration with the development of a dirty looking, friable granulation tissue is very characteristic, especially if associated with a hard, firm edge. This induration is usually irregular, much more marked, both in quality and quantity, in some spots than in others. In the basal celled growths there are frequently definite pearly white cancer nodules at the edge. In practically all of the spino-celled and in many of the basal celled neoplasms the new growth is firmly fixed to the surrounding tissues. Deep induration is likewise an almost positive indication of cancer, although occasionally simulated by an inflammatory condition. Enlargement of the lymph glands, the nodes being hard, firm, discrete and but slightly tender, and not coming on until several months after the appearance of the original growth is characteristic of cancer, for the nodes associated with inflammatory conditions are usually soft and painful. The above is a picture of late or of moderately late cancer, but we should always attempt to make a diagnosis before such a stage is reached. The following points are especially helpful in making an early diagnosis. The history of a pre-existing abnormality from which the lesion has sprung, especially keratotic overgrowths; the presence of a crust, which when removed shows a minute ulcerated area; the presence of a slight amount of induration; and a few pearly, firm nodules at the edge of the ulceration. If this lesion persists for six weeks the diagnosis is almost assured. The court of last resort is microscopical examination.

As is well known, cutaneous cancer may spring from various layers of the surface epithelium or from hair follicles or glandular apparatus. The most important of the varieties of cancer are the deep prickle celled cancer, the prickle celled malignant wart, the cuboidal celled cancer and the basal celled cancer. In a previous communication I have called attention to the differences between them as regards their clinical behavior. In the very early cases it is practically impossible to tell the difference between these lesions except by microscopical examination. However, the location of the lesion and the character of the precancerous lesion from which it arose are often of very great help. Neoplasms springing from arsenical keratoses, X-ray keratoses, tuberculous ulcers, scars of burns or traumas are usually prickle celled. Likewise growths of the limbs[14] and mucous membranes are usually of this more dangerous type. Neoplasms of the skin of the face, especially those springing from the eyelids or the region of the nose, are usually basal celled in character.

In the more advanced cases diagnosis is much easier, for rapidly growing, deeply indurated growths are usually spino-celled, while slowly growing lesions are usually basal celled. The spino-celled lesions have a rougher and more verrucose surface. The cuboidal celled tumor resembles the prickle celled tumors in its general clinical characteristics, and need not be differentiated for practical purposes. The prickle celled malignant wart is a more or less pedunculated neoplasm without any infiltration at its base, hence does not metastasize.

The laboratory diagnosis of malignancy is an extremely important affair in many instances, especialy as it is the court of last appeal.

If one is unable to tell whether or not the lesion under consideration is a chancre or an epithelioma the correct procedure is to make a dark field examination of some of the serum from it for spirochaetes, remembering that an occasional coarse spirochaete may be found in the exudations from a malignant condition. As a general rule the Wassermann test is not positive until the chancre has been present for over two weeks, and the luetin test is practically never positive in the primary stage. In estimating the value of the Wassermann it must always be remembered that cancer may arise in a person who has had syphilis. Hence the presence of a positive Wassermann by no means excludes malignancy. In the case of a tertiary lesion spirochaetes are, of course, not found, but the luetin reaction is fairly constant.

The only sure laboratory test for tuberculosis is either the finding of the bacilli or inoculating a guinea pig with a bit of

the tissue; the former is usually rather difficult.

In blastomycosis the causal organism, a yeast-like body, can usually be demonstrated under the microscope in pus expressed from one of the miliary abscesses.

The question of biopsies in suspected malignancy is extremely important. The general rule must be laid down that it is unsafe to perform a biopsy in such instances, unless the tissue be removed with either the actual or electric cautery, thus sealing up all lymphatics and blood vessels, so that there is no risk of cancer cells escaping into them. Much the better way is to excise the complete lesion and make the microscopical diagnosis from a section removed from this.

Hardening, blocking, cutting and staining require no special comments. The criterion of malignancy is of course the breaking through of the limiting basal membrane by epithelial cells. In addition the cells frequently vary in size and shape and mitotic figures, often atypical, can usually be found. It should be remarked that the basal celled neoplasms can be distinguished from the spino-celled by the fact that the cells are much smaller, that they do not form epithelial whorls or pearls, and that they stain more intensely with basic than with acid dyes. In addition the cancerous alveoli are smaller. In the spino-celled growths the alveoli are often large, epithelial pearls are usually formed, and the stains selected by the cancer cells are the acid ones, so that the cells look a light red color. In the cuboidal celled lesions the cells are large, form large alveoli, do not form pearls, and stain with the basic dyes. In either type of cancer there is but one prevalent type of cancer cell, the downgrowths of epithelium do not show typical spino-cells surrounded by typical basal cells, as occurs in the various inflammatory conditions and in the various benign tumors or hypertrophies. Nevertheless Nabarro and Higgins[15] as well as Bloodgood[16] have pointed out that inflammatory conditions may occasionally simulate prickle celled carcinoma under the microscope.

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AUTHORS' ABSTRACTS

Medicine

The Causation and Treatment of Pellagra: H. E. Bond, Kingston, Jamaica, Medical Record, May 5, 1916, p. 816.

The main object of this paper is to establish the fact that pellagra is caused by alimentary toxemia, modified by the actinic rays of the sun. The first part deals with the relationship of the gastro-intestinal tract to the skin, the relationship of other organs to the skin and the relationship of other conditions to the skin. In this the author firmly establishes that the relationship which exists between the three conditions mentioned above is maintained by the sympathetic nervous system. In the case of the intestines the connection is made between the plexuses of Meissner and Auerbach through the chromaffin tissue to the central nervous system. It is advocated that the toxins from pathogenic bacteria of the coli group acts upon these plexuses, and then on the central nervous system, producing pigmentation, degeneration and neuritis. The second part of the paper deals with the actinic rays of the sun as a contributory factor in the causation. There being a greater amount of blood in the extremities during the Spring and Summer time, it allows the sun's rays to act upon a skin whose resistance is already lowered by defective nerve innervation.

With regard to treatment the condition clears up under the usual intestinal antiseptics, e. g., salol and beta-napthol. Locally, a protective ointment may be applied to the affected parts. A well-balanced diet, ripe bananas, ripe papaws. Keep in the shade as far as possible.

Cases of Interest—Pneumococcus Arthritis and a Very Unusual Type of Broncho-Pneumonia: A. L. Levin, New Orleans, La., New Orleans Medical and Surgical Journal, June, 1916, p. 795.

Case I.—Pneumococcus Arthritis. This case is of interest for these reasons. 1. Rarity of its occurrence. 2. Not preceded by pneumonia as is the rule. 3. The probable point of entrance of pneumococci.

History.—A middle-aged engineer, suddenly stricken with pain in right knee. Classical symptoms of inflammation present. Factors in past history—gonorrhea 20 and diphtheria 4 years ago. About a month previous to present trouble, probing of obstructed tear duct was practiced. Insignificant traumatism of knee occurred the day previous. Elevated temperature, high leucocyte

count and fluctuation suggested pus. Drs. Hatch and Matas in consultation. Surgical intervention was the only course and it was done. Pathological report of pus and tissue pneumococci. Infection persisted for six months. Was on operating table four times. Final results excellent except for a stiff knee.

The fact that pneumococci are found in the respiratory organs leads me to believe that the infection may have entered the blood stream through the traumatized tear duct. Should it not be a lesson of caution against probing?

Case 2.—Six-year-old girl, after five weeks' pertussis, developed a very irregular, septic type temperature. Maximum 106°, minimum 94° by rectum, with normal intervening. Physical examination of entire body, including senses negative, except for faint blow of heart. High leucocytosis present. X-ray—Shadow at base of right lung, probably empyema. Needle disproves X-ray. Malignant endocarditis considered. Repeated blood cultures and plasmodia negative. Catherized specimen of urine repeatedly negative. Medicine has no effect. After 17 days of illness, temperature and pulse became normal. X-ray at this time shows lung clear. The following few weeks, recrudescence of temperature for a few days, which was checked by quinine. Was it broncho-pneumonia?

The Frequency of Unsuspected Syphilis, With Special Reference to Its Incidence in So-Called Neurasthenia: James S. McLester, Birmingham, Ala., Journal of the American Medical Association, June 24, 1916, p. 2063.

The routine employment in private practice of the Wassermann reaction on 300 consecutive patients revealed a great many instances of heretofore unrecognized syphilis. These patients represent a higher social level than do those of the numerous hospital reports, and, seen only in consulting practice, their study offers some indication of the role played by syphilis in the more obscure syndrome of internal medicine.

Eighteen and eight-tenths per cent of the 300 serial tests were positive, and of the 56 positives, 34, or 61%, gave no history whatever either direct or suggestive of luetic infection.

A noteworthy group was formed by thirty-two patients who, according to current usage, must be called neurasthenics. Approximately 50% of those falling in this group gave a positive Wassermann reaction. Of the five patients who submitted to lumbar puncture, the spinal fluid was negative in all except two. The question then arises, are not such neurasthenics with positive blood Wassermanns potential paretics?

The author concludes that syphilis is a vastly more important factor in internal medicine than is commonly thought; and that a large number of so-called neurasthenics are infected with syphilis, possibly presenting a mild form of cerebrospinal lues.

Gastric Ulcer Experimentally Produced by Means of the Staphylococcus Organism: A Preliminary Note. Edgar C. Steinharter, Cincinnati, Ohio, The Boston Medical and Surgical Journal, May 11, 1916, p. 677.

Observations were made on 40 rabbits. Part of them received locally into the stomach wall an injection of the staphylococcus pyogenes and a very weak acetic acid solution. In the remainder the organism alone was injected intravenously into the general circulation. Based on this study the following statements are made:

1. Typical peptic ulcers varying from one-quarter of an inch in diameter were produced by injecting locally into the stomach wall the staphylococcus organism of certain grades of virulence and a weak acetic acid solution.

(a) The injection of the organism alone usually caused the development of a small localized and firmly walled off abscess at the point of injection.

(b) The introduction of the acid alone into the stomach wall, beyond causing more or less edema, provoked no gross pathological change in the tissues: It certainly never caused an ulcer; but it did seem to increase the susceptibility of the area for localization of the staphylococcus injected into the general circulation.

2. The tendency of selective localization in certain organs was found to depend among other things upon the virulence of the organism and could be modified by cultivation in functionating tissue. For instance, a culture of the organism isolated from a joint was apt to form, on intravenous injection, a septico-pyemia with abscesses predominating in the skeletal and myocardial muscles; that from the appendix showed an affinity for the intestinal tract, so that at times the appendix was the only organ revealing any gross lesion.

Vitamin Solution of the Pellagra Problem: A Preliminary Note. By Edward Jenner Wood, Wilmington, N. C., Journal of American Medical Association, May 6, 1916, p. 1447.

The idea is suggested that an analogy may be made between the relation of rice to beri beri and the relation of corn to pellagra. Unintentional experimentation of Nightingale in South Africa would tend to show that the highly milled corn would cause pellagra and that substitution of the whole grain without any removal in milling produced a curative result "immediate and magical." Experiments carried out on pigeons indicated that there is a definite disease condition which is due to feeding highly milled meal and that it is promptly relieved by feeding the whole grain crushed in the laboratory. If the results are borne out by further evidence it would seem that the solution of the pellagra problem will be a simple one well within the reach of the poorest.

This idea is not a new one. It was theoretically suggested by Casimir Funk in 1912, after his solution of the beri beri problem. It will be recalled that he found that there was a deficiency in polished rice which was due to the lack of a complex chemical body which he named vitamin. It seems reasonable by the theory above suggested to account for the appearance of pellagra when it was first described. Certainly the disease could not have been overlooked and it will be interesting to study the time of its appearance with the time of the disappearance of the old water mill which ground the whole grain.

TROPICAL DISEASES AND PUBLIC HEALTH

OPERATION OF THE VITAL STATISTICS LAW IN ARKANSAS.*

By C. W. Garrison, M.D.,
State Health Officer,
Little Rock, Ark.

In the Spring of 1913, after a very tedious dry labor extending over a period of several years, Arkansas gave birth to what has appeared to some to be an obstreperous monstrosity, which caused very severe lacerations. It was immediately reported and named by the accoucheur as Public Health Act. No. 96, 1913. An attempt at repair was immediately undertaken, but union by first intention failed and it is now healing by granulation.

Under the above Act, authority was delegated to the State Board of Health as follows:

"Sec. 7. That the State Board of Health shall establish a Bureau of Vital Statistics and provide an adequate system for the registration of births and deaths, by formulating and promulgating rules and regulations prescribing the method and form of making such registration.

"Sec. 8. That the Secretary of the State Board of Health shall be the State Registrar of Vital Statistics, and it shall be his duty to carry into effect the rules, regulations and orders of the State Board of Health. The Board shall provide suitable apartments, properly equipped with fireproof vaults and filing cases, for the permanent preservation of all official records.

"Sec. 9. That for the purpose of this Act the State Registrar shall divide the State into registration districts, defining and designating the boundaries thereof and appointing Local Registrars in each district. Each registration district shall have at least one township therein.

"Sec. 10. That each Local Registrar shall be paid the sum of twenty-five cents for each birth certificate and each death certificate properly and completely made out and registered with him, correctly recorded and promptly returned by him to the State Registrar, as required by the rules and regulations. And in case no births were registered during any month, the Local Registrar shall be entitled to be paid the sum of twenty-five cents for each report to that effect, but only if promptly made in accordance with the rules and regulations. All amounts payable to a registrar under the provisions of this section shall be paid by the treasurer of the county in which the registration district is located, upon certification by the State Registrar. And the State Registrar shall annually certify to the treasurers of the several counties the number of births and deaths properly registered, with the names of the local registrars and the amounts due each at the rates fixed herein."

On request, Dr. F. L. Watkins, of the Federal Bureau, was detailed to aid in formulating the rules and regulations in accordance with and acceptable to said Bureau. Not until February 1, 1914, was the Bureau ready for operation. Thus Arkansas has been collecting vital statistics just a little over a year and a half. The State was divided into 1,393 registration districts, each city, each incorporated town and each township constituting a primary registration district, except where two or more primary registration districts were combined to facilitate registration. The Local Registrars are appointed for a term of four years and may be removed for cause by the State Registrar. Each Local Registrar, in turn, immediately upon acceptance as such, is required to appoint a deputy to act in his stead in case of accident or disability. With the approval of the State Registrar the Local Registrar may appoint a Sub-Registrar who is authorized to receive certificates and to issue burial and removal permits. The Sub-Registrar is required to forward all certificates in ten days, and in all cases, by the fifth of the following month to the Local Registrar, who shall forward all certificates of births and deaths to the Bureau by the tenth of the month.

SYSTEM

No corpse shall be interred, entombed, cremated or otherwise disposed of unless a burial or removal permit has been properly issued by the Local Registrar of the district where death occurs. A removal permit issued by a Local Registrar shall be accepted by the Local Registrar in the district where the body is to be interred or otherwise disposed of.

*Read in Section on Public Health, Southern Medical Association, Ninth Annual Meeting, Dallas, Texas., Nov. 8-11, 1915.

It is made the duty of the undertaker or person acting as such, to file the certificate of death with the Local Registrar of the district where death occurred, and no person in charge of any premises on which interments are made, shall inter or permit to be interred, or permit other disposition of any body unless accompanied by a burial or removal permit. And such person must return all permits, properly endorsed, to the Local Registrar and keep proper records of all bodies disposed of.

The rules and regulations governing the transportation of dead bodies conform to the requirements of federal or interstate laws. No disinterred bodies shall be transported to any other state without the approval of the State Health Officer.

It is made the duty of every physician, midwife, or person acting as such, or the father and mother in case no one is in attendance, to report the birth in due form within ten days, to the Local Registrar. A stillborn is registered as a birth and also as a death and treated separately as such.

It is also made the duty of every physician, midwife, and undertaker to register his or her name, address and occupation with the Local Registrar, and in thirty days after the first of each January, the registrars are required to file this list with the State Registrar.

MORBIDITY STATISTICS

The following diseases are made notifiable:

Asiatic cholera, poliomyelitis, epidemic cerebrospinal meningitis, chickenpox, diphtheria, hookworm disease, leprosy, malaria, measles, ophthalmia neonatorum, pellagra, plague, scarlet fever, smallpox, trachoma, tuberculosis (laryngeal and pulmonary), typhoid fever, typhus fever, whooping cough, and yellow fever.

In the case of yellow fever, Asiatic cholera, bubonic plague and smallpox, notification shall be made at once to the local health officer having jurisdiction, and the State Health Officer notified by wire or telephone. Other diseases named shall be reported within twelve hours to local health officer, all reports to be filed with the county health officer, whose duty it is to forward them to the State Health Officer by the 5th of each month.

In the execution of these rules and regulations, much opposition naturally arose when they were first instituted. Physicians, midwives and the lay citizens disapproved because no restriction or requirement had ever before been made in this State (except probably in a few of the larger cities) on bringing babies into the world or disposing of any lifeless form, human or otherwise.

A watchful waiting policy was adopted, but every effort was made to secure cooperation by education and persuasion. From February 1, 1914, till December 31, 1914, 32,728 births and 16,764 deaths were reported. From January 1 till June 30, 1915, 14,329 births and 7,518 deaths were reported. These comparative figures are interesting because they show that fewer birth and deaths were reported the first six months this year than for a corresponding period the first year.

In order to prevent as much lost motion as possible, and to avoid opportunity for the county judges to block payment of the fee bills, as many of the judges had been opposed to the passage of the bill unless they were given appointive power, the bill was drawn to read "the State Registrar shall annually certify to the treasurer of the several counties the number of births and deaths, etc." Thus the fee bills coming due in 1915 were accordingly filed with the county treasurers. Some of the county treasurers paid the claims in accordance with the bill; others did not because there were no funds in the treasury; and still others did not because the county judges objected. It was discovered that the county judge is given authority to O.K. and allow all claims presented against the county under the constitution of the state. Twenty counties are still standing behind this clause. In two counties where Local Registrars have entered suit for payment of claims, the Circuit Court has reversed the ruling of the county judges, holding that the bill is not invalidated and ordering settlement of same. In one instance the judge complied. In the other, decided October 20, 1915, the judge advises that he will appeal to the Supreme Court. Thus in most of the counties fee bills were delayed and in twenty counties the registrars have never received compensation. This has made it very difficult to secure registrars.

Many doctors object to making reports unless they receive a fee and loudly protest

when they are compelled to furnish postage in forwarding certificates to the registrars. In a few instances the penalty has been invoked for violations; but the Bureau has had so much to do and so little with which to do it, that general prosecutions have been deferred until the legal points are cleared up.

The bill also provides that county judges shall concur with the State Board of Health in the appointment of county health officers. In many instances an agreement could not be reached, and in several counties the county judges have refused to pay any salary to the county health officers, authority being given to them to fix the salary. Consequently very incomplete reports of notifiable diseases have resulted; and where so much opposition is encountered from officials who have control of the finances it makes it very difficult to secure co-operation. However, decision from the Supreme Court is expected this Winter that should clarify matters considerably.

The limited appropriation prevents the employment of an adequate office force, and consequently the counterchecking of the reports of the registrars with those of undertakers, etc., and the follow-up work that is so essential, must necessarily be dispensed with. The requirement of burial permits has caused more annoyance to and objection from the rural population than any other regulation. It is contemplated to meet these objections, in the future by appointing casket dealers as Sub-Registrars where there are no Registrars, and appointing more Sub-Registrars in inaccessible communities.

Since the father and mother are required to make reports of births and deaths where physicians or persons are not in attendance, and since they are required to submit the name of the baby to the Registrar subsequent to the time the accoucheur makes report, provided the baby is unnamed, the writer is of the opinion that it would be better to place all responsibility on the parents and require them to report all births.

To further increase the efficiency of the Bureau of Vital Statistics the writer is of the opinion that the law should be amended so as to empower the Registrar to fine all violators and collect the fee without recourse to court proceedings and be allowed to keep as his own such fees collected as reward for his vigilance.

METHOD OF NUMBERING REGISTRATION DISTRICTS.

In the method adopted by the Bureau in Arkansas, a number is given to every primary registration district. In case the primary district stands alone as a registration district, the primary number serves as the registration district number.

It will be noticed in looking at the attached lists of counties, that the primary number of cities begins with 2001. With a few unused numbers left in each county, it will at any time in the near future provide for any town that may be incorporated as a city without destroying the system of numbering. The first incorporated town (Almyra), in the first alphabetical county (Arkansas), would be designated as 3001, and all other incorporated towns would be numbered in the 3000's. In the numbering of townships, it is well to arrange them in their alphabetical order, and begin with 5001, numbering them consecutively. The particular advantage in this system of numbering is that when you find a certificate bearing any number in the 2000's, you immediately know that this birth or death occurred in a city. If it bears one of the numbers in the 3000's, it is known at once that the birth or death occurred in an incorporated town. A certificate showing primary district in the 5000's, would show that this birth or death occurred outside the municipality, if one should be located within the township.

Under the head of cities, primary district numbers from 2002 to 2005 inclusive are not used. Likewise, under incorporated towns primary numbers 3005 to 3014, and under townships, primary numbers 5016 to 5026 inclusive, were left blank. The purpose of holding out these numbers in each group of primary districts (cities, incorporated towns and townships), has this advantage; that at any time a city or incorporated town is brought into existence, it may be given the next consecutive primary number. This same thing will apply to townships as well. By this means provision is made for many years hence, without having destroyed the system of consecutive numbering of the primary districts.

By referring to Arkansas County, you will notice we have provided for registration districts, 1 to 10 inclusive, and in the next alphabetical county, Ashley, the registration districts provided are numbers 11 to 20 inclusive.

In Arkansas County, it will be noted that under the list of primary districts cities, only one city is named, and it is designated as primary district No. 2001, and we had districts 2002 to 2005 inclusive, which were not used, these numbers being held in reserve for the reasons stated before. With this consecutive system of numbering, the primary districts under the head of cities in Ashley County would begin with 2006, but as there are no cities in Ashley County, five numbers are withheld, and so on through each county. This same procedure is followed in numbering primary districts under the head of incorporated towns and townships.

Each county in the State is taken up in its alphabetical order and primary district numbers assigned, using the method described herein.

A provision is made in the "Rules and Regulations" for the combining of a municipality with the township in which it is located, the wording of which is as follows: "Provided that the State Registrar may combine two or more primary registration districts into one registration district." In Arkansas County there are five municipalities, one city and four incorporated towns, and adopting this system of numbering, we combine the city primary registration district with the township registration district, designating it as:

Registration District No. 1,

Primary District No. 2001, Stuttgart City,

Primary District No. 5006, Gum Pond Township.

The next district would be the incorporated town of Almyra, combined with the township in which it is located, making the second combination in this county, taking the next registration district number as follows:

Registration District No. 2.

Primary District No. 3001, Almyra, Town.

Primary District No. 5011, Mill Bayou, Township.

It is at times advisable to combine two townships into one registration district, although this is not to be encouraged. But when such a combination is made, the method of numbering the registration district thus created will be the same as that employed in any municipality and township.

REGISTRATION OF BIRTHS AND DEATHS IN DALLAS, TEX.*

By Emmit B. Summers,
City Registrar of Vital Statistics,
Dallas, Tex.

Death registration in the city of Dallas began in the latter part of 1887. City registration of births began in February, 1910. Before 1910, Dallas never had any birth registration other than the few births that might have been reported to the County Clerk.

At the beginning of death registration only a portion of deaths, as compared to the present time, were reported. In giving the name of the deceased we often found only the initials stated, which makes it difficult, if not impossible, to find the record of deaths that occurred at that time. The causes of death were often given in such manner that they could hardly be classified according to the international classification of deaths. Too often we find it reported as "Not Stated" when giving the cause of death. This was possibly the fault of the physician to a certain extent who furnished the death certificate, and not altogether the fault of the registrar. When the cause was assigned as "Tuberculosis" it did too frequently fail to state whether it was pulmonary, tuberculosis of the bone or the kind that it might have been, and the exact location.

In many instances we found where deaths had been reported in the city when, as a matter of fact, they really occurred some twelve or fifteen miles outside of the city limits of Dallas. Some of the deaths that occurred inside the city limits did not show the street address.

The occupation of the deceased is one

*Read in Section on Public Health, Southern Medical Association, Ninth Annual Meeting, Dallas, Tex., Nov. 8-11, 1915.

part of the certificate which is of importance, but in most cases during the history of early registration was left off entirely. Statistics concerning occupational diseases are compiled here.

Up until April, 1888, the name of the attending physician does not appear on the death certificate or register. Since that time the name of the attending physician is only given in some instances, but as we near the present date this trouble is eliminated.

In our death register, volume No. 2, we find where the death records were reported as to the number of deaths handled by each undertaker for the month. In places we notice where we find no deaths for a certain month, that is reported in the register, then later on, possibly five or six months or even eight months later, we find where the month that was missing has been recorded, but entirely out of place. This is the fault of the undertakers and physicians in not turning in the certificates to the office of the local registrar; or it is the fault of the registrar in not seeing that they were turned in and recorded correctly and in due time. I feel sure that it was mostly the fault of the registrar. It is his duty to see that they are filed in due time and when they have been filed to record them in their definite time.

Since April 1, 1913, I have had charge of birth and death registration in the city of Dallas, and at the time I took charge of this work I began a study of methods to the end of improving vital statistics.

Some certificates were brought to this office in a very bad condition as to the information required. Some of them did not have the address and place of death. Some of them did not even have the name of the deceased; and in a great many instances the sex and color were left out.

In calculating the age of a deceased body, of course you take the date of birth and the date of death to get the exact age. In a number of instances on death certificates I have found where the date of birth, when subtracted from the date of death, would give a different age from that reported in the certificate. In the first part of this past October a death certificate was brought to my office showing the date of birth to be November 6, 1915, the date of death November 6, 1915, and the age of the deceased was something over sixty years. This was purely a matter of negligence on the part of the undertaker.

In giving the name of a deceased single female I always see that the surname corresponds with that of the father. In taking into consideration the marital relations or conditions, in many instances we have found certificates of a female single deceased where the name is different from that of the father. If you will consider this for a moment you will readily realize that there is either a mistake in giving the name of the deceased or the name of a step-father has been used instead of the father.

In giving the occupation of the deceased a statement should be made as to what kind of work he did. If he is a laborer it should be stated whether or not he is a ditch-digger, a street sweeper, etc. If he is a mechanic it should be stated whether he is an automobile mechanic, a factory mechanic, etc. In a great many instances the death certificates of children are left blank. I have required that these blanks be filled in, even though the child was only one day old. If there is no occupation, write the word "none." If the child attends school it should be stated "school child."

In giving the maiden name of the mother, we find that the undertaker has reported this part of the certificate a great deal as the physician records the maiden name of the mother on the birth certificate, giving the present name instead of the maiden name. It should be as is required on the certificate.

That part of the certificate which shows the length of time a physician has been in attendance is one of great interest to insurance companies, and also for statistical data in the way that it furnishes information to determine an average length of duration of certain diseases.

As to the causes of death we have found that the physician, as a general rule, does not apply the same in a way to be specific in that the death is not classifiable under any particular disease. For instance, the cause of death given as "Peritonitis" without stating what caused it would be practically worthless. It is nearly as bad as the term "Natural Causes" and equally as

bad, if not worse, than that of "Heart Failure." If a person dies from peritonitis it should be stated whether it was due to peritonitis caused by typhoid fever, tuberculosis or pueperal conditions. When it is stated that peritonitis was caused from one of several conditions from which it might have been caused, then the cause of death can be classified; otherwise it is not specific enough.

The way that this has been remedied in Dallas is that we informed the local undertakers that a cause of death must be stated in such a way that it can be classified, stating to them that if they apply at the office of the local registrar for a burial permit that the permit will not be issued unless the cause of death be given so that it can be classified. We have found it necessary in several instances to hold the death certificate until the cause of death was arranged so it could be classified, at the same time not trying to induce the attending physician to vary from his diagnosis, but to be more careful in stating it. This necessitated the funeral being put off until a later hour. When this was done a few times the local undertakers found it more convenient to inform themselves and get into closer connection with the physicians to the extent that only one trip to the physician was needed to get the cause of death accurately reported at the time that the physician placed his signature on the certificate. Even now at times we find where the cause of death is not exactly satisfactorily stated, but there has been a marked improvement.

A burial permit is issued for all death certificates, even though the cemetery be outside of the City limits. We have had a hearty co-operation from sextons, cemetery keepers and undertakers in assisting us to improve vital statistics records. After the end of each month the sexton delivers these burial permits to the office of the registrar and they are checked with the stubs on file, thereby assuring us that each burial was carried out in strict conformity with the State laws governing such things.

The birth registration in its beginning was merely a joke in many instances. We found where the birth of a child had been recorded as many as three times, and in giving that record only a small portion of the information required had been placed on record. We found in many instances where the date of birth was not given, and where the sex and color was not stated.

At the time I took charge of vital statistics work in Dallas, some months the deaths would exceed the births. I believe it was twice that it happened during my connection with this work. I determined that births should exceed the deaths each month, because there were really more births than deaths and it was not long until I learned that there were only a few negligent physicians who were failing to report them as they should. I adopted a plan of taking the death certificates of children under thirty or sixty days of age, seeing, of course, that the birth of the child, according to the death certificate, showed it to have been born in Dallas; and then I would search my birth register to see that the birth had been recorded. In this way I found many births not recorded. After I had worked on this plan for some time and had been in direct contact with the physicians on this subject, I found that they took a greater interest in reporting births than they had before.

Some months our deaths are less than half the number of births. Each birth and death certificate requires the personal signature of the physician, and when one is mailed which does not have the personal signature, or is lacking in other information, or possibly late in being reported, I address a letter to the physician calling his attention to the parts he has neglected, and in so far as possible request him to correct such and similar mistakes. In this way both birth and death registration has been improved wonderfully.

The registration of Negro births in Dallas is not what it should be; that is, there are not so many reported as there should be. Some months ago I obtained the names and addresses of Negro preachers, school teachers, physicians and social workers, and wrote them a letter calling their attention to the fact that the birth registration of the colored population was far below what it should be and showed them where they could be of material aid to the department of vital statistics in encouraging each birth to be recorded; and

requested that they give me their support in getting better birth returns. This met with their approval; and since that time there has been better interest shown by a portion of them; and some Negro accoucheurs have been located.

Literature has been secured from the State Registrar of Vital Statistics on birth registration; and in the near future we expect to take up the matter of birth registration with various city clubs, church and social workers and probably with other individuals for the purpose of securing better results.

VITAL STATISTICS VITALIZED.*

By W. L. Heizer, M.D.,
State Registrar of Vital Statistics,
Bowling Green, Ky.

Vital statistics vitalized as viewed by the author occupy a place second to none in relation to the welfare and progress of our people. Unfortunately all of the factors which enter into the greatest usefulness of vital statistics do not at present obtain and this paper is written with the hope that it may act as a stimulant toward national, state, city and community efficiency in the collection and use of vital statistics.

Vital statistics in their accepted definition embracing births, deaths, sickness, marriages and divorces occupy a two-fold relation to the welfare of a people. In Kentucky we have called our bureau "Kentucky's Big Family Bible" in that we keep a record of the births and deaths of every citizen of the State. The phrase sounds good but it is not true. We receive the records of nearly all of the children born and of people who die in Kentucky, and if their folks continue to reside in Kentucky, we hope to be able to secure their complete family record of births and deaths. But if the family moves to California or Tennessee, or another registration state, a search through those records will have to be made before a family history can be made complete. If such a family moves to a non-registration state, of which there are about twenty-four, their family history then ends as far as a state official record is kept until such state becomes progressive enough to adopt and enforce a law to record the resources in births and the liabilities in deaths of its most valuable possessions.

The relation of family history to vital statistics, then, is of great importance, for upon a correct record of one's family depend many events of life, including: inheritance, responsibility under labor laws and laws of crime, holding office, attending school, etc.

In this country and in the Southland there is one relation of vital statistics to our life which if presented properly to any legislature would go far toward securing the passage of a vital statistics law and ample funds to enforce it. Our people are an extremely proud people. Our ancestry enjoyed a reputation for sobriety, honesty, integrity and adherence to principle even unto death. Not always clad in purple or fine linen were they,—more often in homespun,—but always secure in their adherence to paths of virtue, righteousness of conduct and pride of birth. Within a few years, even while our grand-children still live, even now, dressed in good clothes, with a veneer of civilization to hide the life of adultery and shameless sin of their fathers and mothers there will be men and women who with no family record may be permitted to associate with our sons and daughters, even marry them, without any means of our knowing that their fair skin and silky hair are but twice or thrice removed from a Mulatto who was conceived in sin.

A properly enforced vital statistics law, correlated with the records of other states, would furnish fathers and mothers of daughters and sons a chance to see what manner of man or woman it is who would reproduce their kind, and afford equal protection to both races between whom marriage is impossible.

For these reasons it would seem wise for the Census Bureau, when directed by your voice through Congress, to enlarge its scope of usefulness by securing copies of all births, deaths and marriage records for permanent file and keep in Washington a continuous index of these events of all the people of the registration area, which at

*Read in Section on Public Health, Southern Medical Association, Ninth Annual Meeting, Dallas, Tex., Nov. 8-11, 1915.

the earliest possible time should embrace all of the population of the United States. In this way a real family record will be kept and will serve the greatest possible good with the least expenditure of time and energy to collect and make it available. Arrangements should also be made to aid the states in a more thorough enforcement of the law by extending the franking privilege to state registrars who are handicapped in most states by a lack of funds.

The second influence of vital statistics to the welfare of the people is found in their relation to the public health. Perhaps this is their greatest value if they could be made available.

In the classified detailed tabulations which involve much time and expense there will be found all the material for a critical analysis of death returns. They are of inestimable value in determining the total loss of life, the effect of certain policies pursued by various boards of health, the trend of death rates, the indications for future courses of action, the relation of population, climate, occupations, etc., to causes of deaths.

But effective health administration in our present state of civilization must deal with the immediate disaster of disease. A general in battle by means of telephones, messengers, aviators, captive balloons, etc., receives, continually, messages concerning the movements of the enemy, his own and his adversary's loss in battle, reinforcements to his own or the enemy's army.

This news, a day, a month or a year after the battle is useless for the immediate conflict. In the same way health boards must receive prompt morbidity reports, or, at least, prompt mortality reports so that they may successfully control the invasion or spread of preventable diseases.

Unfortunately, most health boards do not have sufficient forces to send immediate aid where epidemics are taking their toll in human health and life, but I believe that it is because the people have not seen the actual need for spending the money for such help.

For this reason death rates from communicable diseases in cities, counties, states and throughout the nation should be collected promptly and published at once for the information of the public and its health officials.

In a few instances in Kentucky the death records from typhoid fever indicated an epidemic, and following the well-known line of prevention, foci of the disease disappeared within ten days or two weeks.

Preventable diseases are no respectors of county, city or state lines and just as it is important for a state to secure records from each county or city within its borders, so is it equally important that the state should secure from the national Government immediate reports as to the prevalence of preventable sickness outside its borders.

In 1911, our death records showed three deaths in one month from infantile paralysis in Covington. I was directed by our Board to make a special investigation and found sixty-five cases in this city and Newport which adjoins it; and found also that the city of Cincinnati just across the river had more than two hundred and fifty cases that our Board of Health knew nothing about. It seems entirely practicable for the states to send to the Division of Vital Statistics at Washington immediately upon their receipt copies of death records for preventable diseases within their borders and that this Division could issue special monthly bulletins on the preventable diseases and have available, promptly, such information as would be necessary to protect the health of the people in adjoining territories.

In the case of water-borne diseases this would be of considerable value, as shown by the experience along Cumberland River which rises in Kentucky, flows through Tennessee, and back into Kentucky.

In 1912, our State encampment was held in Middlesboro, Kentucky, located on a branch of the Cumberland River. Typhoid fever appeared in epidemic form. Pineville,—about thirty miles below,—using Cumberland River water to drink, had an explosive outbreak. Barboursville, which is located on this river, after a few weeks also had an explosive outbreak. Williamsburg being warned, as a result of our vital statistics report, escaped with a few cases. The disease continued to appear at various Tennessee points, finally reaching Clarksville, Tenn., which is also on this river.

The death records of typhoid fever tabulated by water sheds and published by our National Division of Vital Statistics would have afforded Tennessee and her cities ample warning to prepare for the coming trouble.

In publishing the comparative rates for diarrheal diseases for cities of a state, or for all the states, it is of extreme value to add a paragraph stating the kind of water supplied, facilities for disposal of sewage, health administration as to markets for food, and such other facts as would enable one to understand the possible relative high or low death rate.

For example, Bowling Green has far the highest death rate from typhoid fever in Kentucky. It has no sewerage system; drinks raw river water from a fairly populous water shed, and has no competent health administration.

Henderson has the second highest rate. It has a sewerage system with a considerable portion of houses connected, but has until recently been drinking raw, untreated Ohio River water.

Thus it can be appreciated how helpful to health authorities such facts, published by the state and community, in relation to certain death rates can be made.

Spot maps showing the number of deaths from preventable diseases in our State have been of great help in educating the people.

When the bill creating our State Tuberculosis Commission was pending, such a map was constructed showing a red spot for each death from tuberculosis for each county in the State, the figures appearing in a small circle in the center of each county. When this was presented to the committee in charge of the bill, the chairman remarked: "I am in favor of anything which will reduce the number of those dots." The bill was unanimously recommended and became a law.

A map of Kentucky twenty-four feet long and ten feet high was constructed with spots of different colors to represent the preventable diseases, and a card placed within the boundaries of each county, showing the total number of births and deaths from all causes and from preventable diseases for each of three years. This has served a useful purpose.

We are at work at present upon the effort to secure a whole-time health officer in each county of the State. For educational purposes at the two State Fairs, Medical Association Meetings, Meetings of Women's Clubs, State Educational Association and at the coming session of the State Legislature, we devised a spectacular exhibit to tell the story of preventable diseases.

A large wheel five feet in diameter was constructed, with one hundred and thirty-six small graves around its circumference, each with a headstone naming the disease responsible for that grave. Tuberculosis lead the rest with forty-nine. This gave the ratio of preventable disease deaths. In the center of this wheel was drawn a large map of Kentucky with 12,451 pins of thirteen colors stuck in it, representing the average number of deaths from preventable diseases for three years by cause, and a color scheme explaining the frequency of each. As the wheel revolved it moved a large clock hand around a four-foot dial divided into one hundred thirty-six sections. As the hand passed each division a white light flashed in a globe, representing the passage of forty minutes of time and one death. When a third of the dial was traversed a blue light appeared representing forty-five deaths in thirty hours, and one complete revolution of this wheel flashed a red light showing that every ninety hours in Kentucky we lose one hundred thirty-six citizens from preventable diseases. We feel sure that this and other means which we have devised to show our people the enormous loss they suffer in health, happiness and money will be the means of securing the passage of our Whole-Time Health Officers Bill, giving a trained man in health work to each county in the State, who shall give up the practice of curative medicine and devote his entire time to preventive medicine.

With their help we hope to be able to secure complete and accurate returns of births, deaths and sickness. From these, as we have done in two counties to demonstate its practicability, spot maps on composition board using different colored pins, will be made showing the exact topographical location of preventable disease deaths in each county, and will be of great value to the Health Officer. Deaths from typhoid fever and dysentery occurring upon the water shed of creeks draining into water supplies will furnish the indication for

warning and action by the Health Boards. Cases of preventable diseases will be collected as provided in an amendment of the model Vital Statistics Law and spot maps of these cases and deaths for each county will afford such an opportunity for the protection and safety of the health and lives of our people that they will not only maintain the system of whole-time county health officers, but will insist upon increasing their effectiveness.

Then and not until then will we be able to realize all that can be accomplished with Kentucky's Vital Statistics Vitalized.

THE NEED OF UNIFORM HEALTH REGULATIONS IN THE SOUTHERN STATES.*

By D. W. Jones, M.D.,
Chief Sanitary Inspector of Mississippi,
Brookhaven, Miss.

Vital statistics are essentially the very basis of all our public health work; and the systems and records have no value for comparative work unless the getting of the statistics is based upon some general plan.

A careful comparison of the health regulations of the Southern States shows such a striking similarity that one is forced to ask why we can not have a uniform set of rules and regulations. Why can not the Southern Medical Association appoint a commission to draw up such a plan as would be acceptable to all the Southern States, at least in its basic features?

Take, for illustration, the matter of interstate travel. The regulations in regard to spitting, cuspidors, sweeping, sleeping, the conduct of railroad authorities in the case of contagious diseases en route, reporting, detention, disposition of infected cars, disinfection, etc., should be the same in every state. I notice considerable difference in the rules of the several states as to transportation of dead bodies, embalming, form of permits, regulations as to disinterments, etc. There seem to be no uniform rules as to embalming in different states; and the penalties for failure to embalm according to regulations vary considerably. Recent cases of hydrophobia attract our attention to the fact that there are no uniform regulations as to transportation of domestic animals. Checking up our dairy output in Mississippi, we find that there are no uniform rules as to the shipment of milk, disinfection of cans, etc. Similarly we lack a perfectly uniform rule as to shipment of meats.

The rules as to the drinking cup, towels, etc., are fairly uniform, but the regulations assuring the purity of the drinking water seem to vary considerably.

All these matters are covered in a general way by the Federal regulations, but many of our states have additional regulations. Why not all have the same? We should have uniform regulations as to interstate quarantine, uniform restrictions as to travel, detention, certification of health; also as to domestic quarantine, length of time children should be kept at home after various contagious diseases, uniform penalties for false certificates, uniform rules for reporting contagious diseases, and penalties. We should have uniform regulations as to maritime quarantine, detention at ports, inspection, docking, unloading, disinfection of ships, examination of sea-faring men, and reporting sickness of such after going ashore. The Southern States should have an agreement as to reporting in good faith all contagious diseases, after a uniform plan, to the several state boards. The carrying out of the terms of such an agreement with the other states as to reporting of bubonic plague by the health officers of New Orleans undoubtedly prevented a panic and the institution of quarantine when this disease was discovered to be in that City.

I find considerable variation as to what diseases are "reportable" and the manner in which they are reported, and the penalties for failure to report. It would strengthen the execution of such a system in one state if the system were uniform in all the adjacent states. For illustration, we have never been able to get our doctors to report tuberculosis in Mississippi by individual names and addresses. As a result we have no way of protecting the pub-

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lic from the renting of houses that may be infected with tuberculosis.

Many other instances could be cited, but it is unnecessary. The only question is, is it expedient for this Association to take any action in the matter?

These matters are necessarily under Federal control to a considerable extent, and the more we leave interstate traffic to the Federal government the better it will be in my opinion. But since the interstate and local regulations must necessarily intervene to some extent, it seems that we might have a commission composed of, say, one representative from each state and one from the United States Public Health Service. Care could be exercised in considering the relations between the state and Federal authorities, and some things could be left to individual states that have unique conditions. This commission could invite the railroads to send representatives to its conferences and thus guarantee their hearty co-operation with any regulations governing transportation. The general rules would of course have to be sent to the individual states for ratification by their state boards. But the fact that they had a representative in the conference would go a long way toward assuring their acceptance.

DISCUSSION

Symposium on Vital Statistics—Papers of Drs. Garrison, Summers, Heizer and Jones.

Dr. H. H. Shoulders, Nashville, Tenn.—It seems to me that state boards of health are guilty at times of introducing ill-advised, or ill-prepared legislation. We introduce and have passed legislation the constitutionality of which is soon attacked, and too often successfully; whereas if the proposed legislation had been submitted to a constitutional lawyer for examination the trouble would have been prevented.

I wish to refer particularly to the numbering system mentioned by Dr. Garrison.

In Tennessee, when I was confronted with the proposition of installing a registration system, I went to Kentucky to get some ideas. And I found that I didn't make a mistake. I made inquiry of a number of men to find out the reason for a numbering system, and I never did find a good reason for one until I took the same up with Dr. Heizer. He went through his system without finding what I considered a proper one. Later, Dr. Heizer did submit a good reason for the trouble, which reason is that it serves to identify each unit in the simplest way. I worked out a plan of numbering which has worked so satisfactorily that I will give it:

The counties were first numbered alphabetically. In Tennessee each civil district, which is our primary unit, is already numbered. Each primary unit has a number with five figures in it. The first two figures to the right are the civil district number. The next two figures are the county number; the fifth figure is either a figure 4 or a figure 2—the four indicating that the district is rural, the two indicating that it is a city. For instance, the figure 41912 is the 12th district in county number 19, and is rural. When a clerk memorizes the number of each of 96 counties he has the entire numbering system in his mind, and has no difficulty, even without a key, of placing any number.

Dr. Heizer has presented a subject which is very timely. Much of present-day public health procedure needs vitality. To my way of thinking, a system of vital statistics is vitalized when it serves well the purpose it is capable of serving. It is vitalized only to the extent it serves its purpose.

One of the most fundamental purposes of vital statistics is that of making the organic unit of society conscious of its conditions. When the unit of society is made conscious of its conditions the very consciousness brings activity—activity of the proper sort—a co-operative activity.

Laws seeking to protect the public against such catastrophies as hotel fires, railroad wrecks, mine explosions, etc., are far in advance of and more efficient than, public health laws. The reason that is so, in my opinion, is that society is made immediately conscious of the loss when the wreck occurs. It may be trivial, in point of loss of life, but the newspapers carry a story of it under flaring head lines. Secondly, of course, vital statistics serve to direct our public health activities, or else they are at random.

It goes without saying that for our statistics to be of vital interest they must tell the truth, and then must be properly interpreted.

The public conscience is easily awakened by the presence of epidemic diseases (so-called contagious diseases), and public health authorities have almost unlimited powers in dealing with them. Vital statistics will precede and serve to bring about the awakening which must occur before many of our more insidious and more deadly diseases will be under proper control.

Dr. Oscar Dowling, Shreveport, La.—In 1913 over 1,000 bills on public health were introduced in 43 state legislatures. Of these, Dr. Green, of the American Medical Association, says: "Many of the bills were no doubt carefully drafted; and if their passage could have been secured they would have been valuable additions to the laws of the states. Most of them, however, represented hobbies and theories rather than facts." He adds further: "To expect legislatures composed mainly of laymen without scientific knowledge to separate the wheat from the chaff was asking an impossibility. Some of the states undoubtedly secured valuable additions to their public health laws, but in many cases the patience of the legislatures was exhausted through the presentation of loosely drafted measures not in shape for serious consideration."

The need for uniform health regulations is apparent to any physician or layman who gives the question a moment's consideration.

The underlying reason for uniformity is the reserve strength and force which such a set of regulations would imply. If every state in the Union should pass and enforce a sane, uniform regulation on treatment of tuberculous patients in county sanitoria, in a few years the death rate from this disease would be immeasurably lowered. If every state would adopt and enforce a practical regulation preventing the sale and advertising of even one fraudulent patent nostrum,—say a cancer cure or "female remedy,"—the effect would be sufficient to awaken a public sentiment against the patent nostrum evil in general; and reputable newspapers would cut from their columns the most objectionable of this class of advertisements. So if it were not trivial, the subject of legislation would matter little. It is the effect from uniformity of purpose and action that would count.

One of the weaknesses of our health work lies in the lack of confidence in the public in proposed measures or those in force. Critics say frankly, "You medical men do not agree; you don't know what you want," while the skeptical laugh at the diverse opinions of health officers and the inconsistencies of regulations of health boards. They tell us, for example, the New York Board of Health has given up fumigation and the rest of you make us go to the expense and annoyance of this performance.

Why can't you people agree? A concensus of opinion framed into a sensible law would have untold moral effect in establishing confidence in the science of community hygiene and belief in the necessity of obedience. The regulation of the United States Public Health Service which requires that a certificate be obtained showing quality of water used by the railroads at every station where water is taken, is a case in point. No one questions the protection to the traveling public which is insured by this regulation. No one thinks of ignoring or dodging and every community in which the water is condemned "gets busy" without delay to remedy whatever faults there may be with the supply. No community wants to be under the ban of having bad water. This attitude is proof of what happens when a law is believed universal and irrevocable.

That is point number one in favor of uniformity in health legislation. Another reason equally important would be the agreement as to fundamentals which would be a first requisite. Dr. Green suggests that many of the proposed measures are freak measures,—the fads and theories of persons who are well meaning, but not well informed. A law pertaining to health which is not based upon scientific knowledge discredits the whole structure of health protection. A law requiring a marriage health certificate may be needed, but an impossible law on the subject will retard progress toward the end in view. It would be easy to unite on essentials. A committee to represent sections could be agreed upon and their recommendations accepted. This would have an effect on the legislatures and would pave the way for adoption. Does this plan seem impracticable? It has worked out in other social movements, and health activities in many aspects are sociological.

There is yet another point which is important. Administration would be much easier. We have now even among health officers, in moments of crisis, a feeling of uneasiness. Often we are also ignorant of the regulations of other states and, therefore, not certain how to act until information is gained by wire or the 'phone. However, this inconvenience is slight compared with the feeling that the scheme is incomplete and unscientific. To tolerate such conditions is not common sense for business men and men who have been trained to know and value co-operative effort.

These are only a few of the many aspects of this subject most vital to advance in public health. They are sufficient to direct attention to the need for a proper understanding and immediate action by all who are interested in the enforcement of sane, sensible, practical and enforcable laws.

Dr. James A. Hayne, Columbia, S. C.—The fact is we have exactly the same law in South Carolina that they have in Arkansas. It was prepared by the same person in Arkansas who prepared it in South Carolina,—namely, Dr. Wilbur. The doctor came down to South Carolina to prepare a vital statistics law for the State; and she operates well under the laws as passed. It contains very few paragraphs—I believe nine—and it is worked out by the State Board of Health in the form of regulations.

It was suggested that a competent man be selected on a salary to handle the registration of births and deaths, and a fund was set aside to print all bulletins necessary and all expense incident to the duties. We will be ready on the first of January to start work. We had first appointed all magistrates and local registrars. Then we had to eliminate the registrars and finally provided for a registrar in every township. We have about 625 registrars in the State. The very first month or the second month, rather, that the law was in operation Greenville, Spartanburg and Columbia were admitted to the registration area of the United States. Those cities show reports of 27,000, 17,000 and 18,000, respectively, which give us in the registration area four cities. Our first month gave us fifteen and six-tenths deaths per thousand population and twenty-seven births per thousand.

These birth certificates and death certificates are bound together, numbered and card indexed. Up to the present time we have a registration of fourteen and six-tenths of deaths for every twenty-six thousand; that is, for the first ten months that we have had the registrations. We immediately commenced tabulating the returns on contagious diseases; and the first six weeks after the law went into effect we had this published in the daily papers, giving the people some idea of what we wanted from this statistics law that we were not able to get before.

The death rate from typhoid fever was twenty-six per one hundred thousand.

We have had stumbling blocks in the carrying out of this law. In the order of importance I will name the general practitioner. He is the greatest stumbling block at present in both vital statistics and the reporting of communicable diseases. The general practitioner is generally autocratic. He is accustomed to giving his own individual opinion of a case and not the facts. Being autocratic, he reports what he pleases.

He has children and a wife to feed and his horse or his automobile to run and when the general public refuses to give support to the physician who treats and reports the cases it is of no interest to him. It influences his judgment, thereby causes annoyance. Until the general public is educated to want the physician to report communicable cases he will not do so.

Then again the anti-narcotic law is bearing down upon him with a burden that he is unable to bear. He says he can not sign a death certificate, giving certain requirements. He wants the 25 cents. No one else can sign it but himself and all of these things produce a parting of the way. We must find a solution of the situation. We are up against just the common variety of general practitioner. The specialist on the eye, ear, nose and throat will help us; the surgeon will help us; but the man who is driving a Ford or a horse or a mule, used for earning his living, is not going to do anything to decrease the typhoid rate in his community or any other rate because he is making his living out of it.

It is all very well to talk about altruism; but there isn't a state in the Union in which they have gotten the correct data on malaria. South Carolina gives the highest report on malaria. There isn't a state in which there are over 20% of the physicians who will answer the questions absolutely the same on a given case. And that is also true of typhoid, tuberculosis, etc.

Dr. W. S. Leathers, University, Miss.—I think it very important that this Section follow the suggestion of Dr. Dowling and Dr. Jones in regard to having uniform health regulations. That is a very important matter. The going into court with their differences in so far as regulations are concerned creates a serious situation.

I think it would be a good thing to have a committee appointed, consisting of a representative from each state, a representative from the Federal government, and one from the United States Public Health Service to act together on this matter. I believe if we could adopt resolutions that would reasonably apply to the laws of the several states that it would enable us to go a long way toward systematizing vital statistics and everything else.

Dr. R. H. von Ezdorf, U. S. Public Health Service, New Orleans, La.—It seems to me that it would be proper to have this matter considered at the conferences that are held annually with the United States Public Health Service of all state health officers of the United States, and therefore it would not be necessary that a special conference of state health officers be held. There is no doubt that uniform state health regulations should be adopted and some standard or model form of regulations covering certain subjects will, and it seems to me should, be drawn up at the annual conference to which I have referred. I believe some steps have already been taken toward this end.

Dr. F. A. Coward, Columbia, S. C.—We might in the future discuss uniform regulations just as we are doing today, but unless we draw up some definite plan or arrange some kind of program we shall accomplish nothing. The resolution can do no harm.

Dr. W. L. Heizer, Bowling Green, Ky.—I had the privilege of being present at the conference in Washington of the state and provincial boards of health. There were not more than ninety-five present. Some of them were from Canada and from other foreign countries; and some of the men who discussed the papers could hardly sneeze good English.

The South has problems peculiarly its own in the regulation and control of hookworm disease, pellagra, malaria and tuberculosis. It would seem entirely right and proper that uniform health laws for the Southern States, especially, could be better conceived, enacted and enforced by a discussion of them which would follow at a conference of men who understand these typical Southern problems. Later, the recommendations of such a committee could be laid before the conference of the state and provincial boards of health and submitted to the United States Public Health Service.

Dr. D. W. Jones, Brookhaven, Miss.—It would serve a very good purpose for the Southern States.

SURGERY, GYNECOLOGY, OBSTETRICS AND GENITO-URINARY DISEASES

MESENTERIC THROMBOSIS AND EMBOLISM: REPORT OF 35 CASES*

By Jno. H. Blackburn, M.D., F.A.C.S., Bowling Green, Ky.

A discussion of the rare and unusual in the wide field of surgery or the reporting of a single case of any particular disease may be considered a matter of presumption. However, when we recall the frequency with which we meet the so-called "acute abdomen," the difficulty with which an accurate diagnosis is made in many of these conditions, the dangers attending a delayed operation in most of them, and the fact that most of them ultimately come to the operating table; these we believe are sufficient reasons to justify the reporting of a case of a relatively rare surgical disease of the abdomen, thrombosis of the mesenteric vessels, which should always receive due consideration.

In conjunction with the study of this case we have sent out inquiries to about five hundred surgeons in the territory of the Southern Medical Association, and we give herewith the results of the investigation of the cases reported. It is our purpose to discuss this case and also to place on record some thirty-five cases of mesenteric thrombosis and embolism which have not been previously reported.

REPORT OF CASE

Miss M. M., white, female, age 16. Seen in May, 1913. Previous History: Began menstruating at about 12 years of age, suffering each month with pains in lower abdomen and pelvis. On April 6, 1910, at 13 years of age, she was operated upon in Lincoln, Nebr., for "cystic ovary on right side (median incision), and found many adhesions. She never recovered fully, always having a soreness across the abdomen and drawing sensations. She suffered with attacks of pain every few months, and eight different physicians diagnosed it appendicitis." On January 21, 1913, when nearly 16 years old, she was operated upon by Dr. E. M. Sanders, of Nashville, Tenn. Through a right rectus incision he found a chronically inflamed appendix with marked adhesions about appendix and cecum, simulating a Jackson's membrane. Also many adhesions about fundus and posterior wall of bladder. Exploration of pelvis showed a broad ligament cyst on right side about the size of an orange. These conditions were relieved and she made a perfectly smooth operative recovery. Dr. Sanders suspected a papilloma, but his records do not show that the tumor was examined microscopically, as the operation was not done at his hospital. Patient was not entirely relieved of pain by this operation, and continued to suffer each month with pain in lower abdomen and pelvis, usually accompanied by headache of greater or less severity.

Present Attack: On May 9, 1913, she began to suffer with pain in lower abdomen as usual; and family thought it dysmenorrhea. Pain gradually increased in severity; abdomen became tender and distended; and on May 11 she developed nausea and vomiting. Seen on May 13 at 10 a. m. by Dr. J. F. South, of Bowling Green, who found her in intense pain with marked distension of abdomen, vomiting large quantities of fluid at intervals, which had fecal color and appearance. Temp. 102°, pulse 160, marked prostration.

Diagnosis: Intestinal obstruction with peritonitis.

To relieve pain, Dr. South gave morphine and atropine hypodermically, to be followed by castor oil and high enema. He returned at 4 p. m. and found that the oil had been vomited, and there had been no result from the enema.

I was called at 5 p. m. and found condition as described above. Pulse had increased to 170; pain extreme and paroxysmal; and marked general distension. Nausea persistent; vomiting at intervals much larger quantities of fluid than she had taken; fecal odor still present; and absolute constipation. Palpation showed general muscular rigidity, with an ill-defined mass in the left lower quadrant. Tender over entire abdomen, but more marked in left lower quadrant. There are two operative scars, one in the median line below umbilicus and one at outer border of right rectus. Agreeing with Dr. South that there was an intestinal obstruction, I advised an immediate laparotomy to determine the cause. This was done at 7 p. m. In view of the extreme condition of the patient the abdomen was opened under Novocaine anesthesia, 1 and 0.5% sol. On account of the mass and induration in the left lower quadrant the incision was made at the outer border of the left rectus over the mass. On incising the peritoneum there escaped a quantity of dark, bloody, watery fluid, under tension. Immediately there appeared a coil of black intestine, tense and about to rupture. Exploration showed that the coils of intestine were adherent to the abdominal wall all about the incision, leaving a small cavity

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walled off with the coils. The most prominent coil was opened and then attached to the lower part of incision. There escaped from the intestine a large quantity of offensive bloody fluid and gas. During the night pulse was 132 to 152; temp. 100 to 102°. Vomiting continued at intervals, dark green fluid. Patient restless; suffering pain occasionally; delirious at times. Cardiac stimulants hypodermically and saline proctoclysis were given. Wound discharged freely, requiring frequent dressings. On May 15, 36 hours after operation, we incised a coil of intestine which presented in upper end of incision. Pulse 140 to 160; temp. 101 to 102°; vomiting continued. May 16, pulse 120 to 130; temp. 100°. Patient sleeping some; expells gas through rectal tube. Drainage has fecal odor. May 17, has good fecal drainage. Pulse 120 to 130; temp. 99.5 to 100.5°. May 18, portion of small intestine two inches long came out in slough with drainage. At intervals of one to three days we removed portions of small intestine, 2 to 8 inches long, the total slough measuring 32 inches. The wound gradually cleaned out, leaving granulating walls with purulent and fecal discharge, and with openings into upper and lower ends of cavity. Pulse remained about 120, temp. 100 to 102° each day. General condition of patient improved for a time; and she took more nourishment for a few days. May 23, slept practically all night, pulse 110, temp. 98°. May 26, began to show evidence of sepsis; very delirious; pulse 162; temp. 97°. Saline proctoclysis with whiskey given freely. May 29, patient somewhat improved; still vomiting greenish fluid at times; taking very little nourishment. May 31, pulse weak and intermittent, 120 to 146. Patient voids involuntarily. Wound shows granulating, healthy surfaces. June 2, patient gradually succumbing to septic poisoning, weak, prostrated, restless, sleeps very little. Pulse gradually became weaker and more rapid; patient retained very little nourishment; became more prostrated; and died on June 6 at 1:30 p. m., 28 days after onset of present attack, and 24 days after operation.

Post mortem examination at 4 p. m., two and one-half hours after death. On extending operative wound upward and downward found mass of small intestines surrounding incision and occupying almost entire left half of abdomen and extending beyond median line at umbilicus. Small intestines were matted together with dense adhesions and in many places covered with flakes of fibrin, showing evidences of peritonitis. Mesentery was much thickened and indurated. That portion of mesentery carrying the thrombosed vessels had sloughed, a typical infarction, leaving a sector of the mesentery missing, the radius being about 4½ inches, the arc about 4 inches. Blood vessels about margin of this sector were thrombosed and filled with clots. Mesenteric glands enlarged. Gangrenous intestine was in upper ileum, 7 to 8 feet from pylorus. Spleen somewhat enlarged. Transverse colon adherent to upper portion of mass of adhesions; ascending colon and cecum apparently normal; appendix absent. Examination of pelvis showed it clean; small uterus pulled to left; right tube and ovary absent, with no adhesions or evidences of papilloma; and left tube and ovary not adherent to mass above them.

ANALYSIS

In this case the age of the patient is unusual, 16 years, most cases occurring after thirty. As to the sex, males are affected about twice as often as females. It is difficult to establish any direct relationship between the conditions reported in her previous history and that found at operation. The first operation for cystic ovary three years previously and the second for broad ligament cyst, chronic appendicitis and adhesions four months before onset of present attack, without evidences of infection, could have an influence only in a mechanical way. Pelvic disorders and operative procedures for pelvic tumors and appendicitis have been followed my mesentric occlusion, and the latent period has never been longer than two to three weeks; in this case it was three months and three weeks. There was no evidence from history or examination of previous endocarditis or involvement of the blood vessels. As to the clinical picture presented, it was apparently typical of acute obstruction of the intestine. There was no blood in stools or vomitus except that found on opening the bowel. The ill-defined tumor should have been suggestive of the existing condition, although a mass is found in only a small portion of cases. The co-existing peritonitis and marked adhesions prevented any attempt at more than an enterostomy, particularly on account of the extreme condition of the patient. An unusual feature was the gradual sloughing and separation of the gangrenous coils of intestine, even up to 8 inches in length, the total measuring 32 inches. At the end of about ten days the patient appeared to be gaining in strength and the outlook was slightly more hopeful, but the proximity of the gangrenous portion of the intestine to the stomach led to exhaustion, and this with the marked septic condition of the patient was more than she could withstand. The rather sudden onset of the attack, the complete gangrene of the bowel in four days, and the condition of the mesentery found at post mortem led us to the opinion that there was an occlusion of the branch of the superior mesenteric artery, although

the usual causative factors are lacking in the history.

As a part of the study of mesenteric thrombosis and embolism and in order to determine if possible the relative frequency of it in the South, we sent out a questionaire to 493 surgeons within the territory of the Southern Medical Association, receiving responses from 115. In many instances the surgeon was unable to answer all questions accurately, the previous history being incomplete in most cases. In some cases no records had been kept and the history was given from memory. In the cases reported the diagnosis was verified by operation or post mortem examination, except in two instances, as shown in the case reports.

Through the kindness and courtesy of Drs. Joseph C. Bloodgood and Alexius McGlannan, who loaned the hospital records, we are enabled to report the following five cases from the Johns Hopkins and St. Agnes Hospitals:

Case 1. Johns Hopkins Hospital. Mrs. L. H., white, female, age 45. First admitted in October, 1901. Diagnosis, Raynaud's disease. Admitted second time to medical side in October, 1912, suffering with burning and distress in stomach one hour after eating; relieved by vomiting of sour, undigested food. Also has distension of stomach. During past 6 or 8 years has had 3 to 5 attacks of acute abdominal epigastric pain, colicky, never radiating; no vomiting. On examination at this time a diagnosis of "Hyperthyroidism; Thrombosis of Iliac Veins; Phlebitis (left leg)" was made. Admitted third time on March 10, 1913, to medical side. Present attack began ten days ago, sudden, severe epigastric pain, radiating to back and shoulders. Pain continued with recrudescence two days later. Bowels constipated, but move well with cascara and enemas; considerable eructation of gas. Veins of right and left hypochondrium, epigastrium and lateral abdominal regions are markedly dilated. Four days after admission pain became more severe, tenderness generalized, patient hiccoughing and vomiting bile-stained fluid, no blood. Muscular rigidity over entire abdomen, more in left lower quadrant; tympanitic on percussion. Leucocytes have risen from 5,000 to 31,000 since admission; temp. 100°, pulse 110, very weak. Clinical Diagnosis: Peritonitis. Operation March 15, 1913, by Dr. J. M. T. Finney. Explanatory laparotomy. Right rectus incision. Considerable quantity of clear fluid escaped. Immediately a large mass of intestines with marked circulatory disturbance was found, bluish in color, covered with streaks of fibrin; near point of gangrene. On palpation of bowel it appeared that lumen was obliterated, felt like solid tube. Mesentery has same hardness on palpation. Resected 2 to 2½ feet of affected bowel, with lateral anastomosis of two ends of intestine, abdomen being closed without drainage. Patient very weak, responding poorly to stimulants. Pulse very weak, imperceptible for several days. Temp. 99 to 102°, and finally developed deep infection of wound. Patient gradually recovered, with vomiting (bile for two weeks), abdominal pain and irregular fever. Microscopic section of intestine showed varying degrees of thrombosis of the vessels of the different coats of the intestinal wall.

Case 2. Johns Hopkins Hospital. J. S., black, male, age 48, single. Admitted June 5, 1906. Has marked arteriosclerosis, innominate aneurism, valvular lesion of heart. On June 10, had soreness and cramp-like pain in lower abdomen. Distended abdomen; and movable dullness made out. Patient became irrational. Acute abdominal symptoms necessitated operation. Clinical Diagnosis: Obstruction of the bowel. Operator, Dr. Sowers. Found ileum gangrenous, bowel proximal to diseased portion greatly distended; thrombosis of mesenteric arteries. Resected 52 inches of bowel, but remaining portions looked unhealthy. Ends of intestine were brought out through wound and drained with rubber tubes. Death two days after operation. Autopsy: Extreme fatty degeneration and dilatation of heart; marked arteriosclerosis of aorta and its branches, with aneurism of arch of aorta, involving innominate artery; thrombosis of superior mesenteric artery; gangrene of entire small intestine.

Case 3. St. Agnes Hospital. Dr. Jos. C. Bloodgood. M. H., white, male, age 47. Admitted May 20, 1907. History of alcoholism. Patient is suffering with intense epigastric pain and vomiting. Has had two similar attacks, four years ago and two months ago. Present attack 58 hours, intense epigastric pain not relieved by morphine; vomiting blood-stained fluid; bowels constipated. Slight distension, marked general muscular rigidity, extreme tenderness in epigastrium. Pulse 126, temp. 98°. Leucocytes 28,000. Clinical Diagnosis: Probable acute hemorrhagic pancreatitis. Operation: Median incision below umbilicus. Large quantity of dark blood-stained fluid escaped. Intestine black. Resected 52 inches of small intestine; lateral anastomosis, with ends of bowel left out of abdominal wound and drained each with rubber tube. Apparent recovery with improvement; pulse good, no fever, taking food, bowels moving, voiding urine freely. On fifth day after operation had sudden abdominal pain, pulse grew worse, blood in discharge from lower loop of bowel into wound; bowels moved with large quantity of bloody fluid. Died in nine hours from onset. No autopsy allowed, but evidences of further thrombosis in lower loop of intestine.

Case 4. Johns Hopkins Hospital. G. H. W., white, male, age 41. July 17, 1900. Five days prior to admission began with agonizing pain to left of umbilicus, absolute constipation for two days. Retching and vomiting for 36 hours. Patient pale and ill; pulse 140, respiration 31, thoracic type; temp. 102.2°. Leucocytes 20,000. Patient became cyanosed, and pulse 170 before operation. Clinical Diagnosis: Intestinal obstruction due to thrombosis of mesenteric artery. Op-

eration day following admission, under cocaine and chloroform anesthesia. Found large quantity of thin dark-brown, bloody fluid in peritoneal cavity; gangrene of loop of small intestine; enlarged mesenteric glands, mesentery black. Excised about three feet of small intestine, bringing ends of bowel out of wound and draining them. Patient died day of operation, 10 to 12 hours. Bacteriological report: Peritoneal fluid sterile; contents of bowel, cocci and b. coli communis.

Case 5. Johns Hopkins Hospital. C. H. C., white, male, age 47. Three weeks ago had attack of slight abdominal pain with vomiting. Has worked since (sailor) with occasional pains about umbilicus, and vomited now and then. Present attack began five days ago with acute pain about umbilicus and with vomiting; cathartics aggravating these symptoms. Absolute constipation for three days. Soreness and tenderness above and to right of umbilicus; moderate distension. Pulse 72, resp. 24, temp. 100°. Facial expression that of peritoneal infection. Rectal examination negative. Under ether a mass was found at right and above umbilicus. Operation September 15, 1896, Dr. Jos. C. Bloodgood. Median laparotomy. Bloody serum in peritoneal cavity, no fecal odor. Mass was omentum over coils of intestine beneath. Mass excised. Found coil of intestine in this mass, 8 cm. of which was gangrenous; no perforation or fecal extravasation. Loop of intestine brought out of wound and opened, wound being closed around loop of bowel. Mesentery normal except large amount of fat. Proximal and distal loops were drained with rubber tubes. On second day loop was excised, but no bleeding. Patient vomited continually after operation bile-stained fluid. On fourth day pulse became very weak, 160, and patient died at 10:30 a. m.

The following cases are, in most instances, reported as answers to the questionaire sent out and are for this reason much more brief than those abstracted from the hospital records:

Case 6. Dr. J. Shelton Horsley, Richmond, Va. Child, white. Diagnosis: Appendicitis and Peritonitis. Abdominal incision showed several feet of small intestine gangrenous; no mechanical obstruction. Patient died on table before resection could be made.

Case 7. Dr. J. Shelton Horsley, Richmond, Va. White, male. Strangulated hernia reduced two days before admission. Diagnosis: Intestinal obstruction. Pain, violent and general; tenderness general, marked; no mass. Nausea and vomiting. Melena followed by constipation. Abdomen distended and markedly rigid. Subnormal temp., pulse about 100. Operative diagnosis, gangrene of small intestine, 12 inches, middle of ileum. Intestine resected. Fecal fistula followed with sepsis; required second operation on 17th day. Patient died in six hours from shock.

Case 8. Dr. E. M. Sanders, Nashville, Tenn. J. S., white, male, age 59. Had inguinal hernia. Clinical Diagnosis: Strangulated hernia. Pain marked, in umbilical region, continuous, increasing in severity. Tenderness general, no mass. Nausea and vomiting of black fluid. Slight distension early, severe later. Temp. 99.5 to 103°; pulse 110 to 140. Evidences of nephritis. Operative Diagnosis: Mesenteric thrombosis. Clear fluid, black intestine. Resected 6½ feet of small bowel. Patient died. Post mortem showed gangrene of 8 feet more of intestine, and severe nephritis.

Case 9. Dr. A. L. Blesh, Oklahoma City, Okla. Clinical Diagnosis: Acute intestinal obstruction. Pain severe, diffused over abdomen, 48 hours' duration. Tenderness diffused. Severe nausea and vomiting, obstinate constipation. Distension slight at first, general, extreme after several hours. Temp. subnormal, pulse progressively more rapid; collapse. Operative Diagnosis: Mesenteric thrombosis. Bloody serum, gangrenous intestine. Quick enterostomy. Death in short time. No autopsy.

Case 10. Dr. Ira J. Sellers, Birmingham, Ala. White, female, age 25. Mild sepsis three weeks previous, said to have followed abortion. Clinical Diagnosis: Suspected Mesenteric Thrombosis. Pain intense, to right of umbilicus, diffused in 24 hours. Tender at umbilicus and in lower abdomen. No mass. Constant nausea and vomiting; bowels constipated; slight distension. Temp. subnormal; pulse 110, increasing. Peritonitis and collapse. Operative Diagnosis: Mesenteric thrombosis, with gangrene of small intestine; serous and purulent fluid, with fecal odor. Resected bowel. Patient died in six hours.

Case 11. Dr. Ira J. Sellers, Birmingham, Ala. White, female, age 32. Had slight blow over abdomen three days before. Clinical Diagnosis: Acute Abdomen. Pain general over abdomen. Tenderness in lower abdomen. Nausea and vomiting constant; bowels constipated. No mass; distension general and early. Temp. up to 101°; pulse rapid. Peritonitis and collapse. Operative Diagnosis: Mesenteric Thrombosis; Intestine gangrenous, serous and purulent fluid. Resection of bowel. Patient died in 22 hours. No autopsy.

Case 12. Dr. Ira J. Sellers, Birmingham, Ala. White, male, age 38. No previous history. Clinical Diagnosis: Acute abdomen. Pain general, and later in lower abdomen; tender in lower abdomen. Nausea and vomiting constant; bowels constipated. No mass. Distension general and marked. Temp. up to 104°; pulse 160. Operative Diagnosis: Thrombosis of mesenteric vessels; sero-purulent fluid, gangrenous intestine. Death in 72 hours. No autopsy.

Case 13. Dr. J. Barnett, New Orleans, La. C. A., white, male, age 45. Previous history good; had double inguinal hernia, each the size of a cocoanut. Left hernia had been down, but reduced spontaneously just prior to operation. Diagnosis, strangulated hernia. Pain at umbilicus, intense from two hours prior to operation. No mass except hernia. Nausea and vomiting severe and continuous. No distension. Temp. subnormal; pulse very rapid and feeble; profound shock. Operative Diagnosis: Thrombosis of mesenteric vessel; no peritoneal exudate, gangrene of ileum.

Resected three feet of intestine, closed ends of bowel, lateral anastomosis by Murphy button. Patient cured.

Case 14. Dr. J. M. Mason, Birmingham, Ala. White, male, age 35. Patient had been operated upon for chronic appendicitis; was seen the following day. Diagnosis: Intestinal obstruction following operation. Constipation, distended and rigid abdomen, nausea and vomiting. Symptoms progressively worse following day. Operation three to four days after first; found dark peritoneal fluid, and intestine black, soft and friable. Enterostomy, and drainage of intestines. Patient died in short time. Autopsy showed thrombosis of mesenteric vessels and gangrene of five feet of small intestine.

Case 15. Dr. W. R. Jackson, Mobile, Ala. J. H., white, male, age 24. Clinical Diagnosis: Mechanical intestinal obstruction. Pain intense, general; tenderness extreme, right side. Indefinite mass on right side. Nausea, progressive vomiting, bile and fecal matter; bowels constipated, early and extreme distension. Temp. subnormal up to 103°; pulse rapid and small; toxemia. Operative Diagnosis: Thrombosis of mesenteric vessels; dark serous fluid, gangrenous intestine. Resection of intestine. Patient died in short time. No post mortem.

Case 16. Dr. W. R. Jackson, Mobile, Ala. J. D., white, male, age 29. Clinical Diagnosis: Intestinal obstruction. Pain extreme; tenderness extreme, on right side. Nausea and vomiting, bile and fecal matter; bowels constipated. Distension, sudden, extreme, general. Temp. subnormal up to 104°; pulse rapid and feeble; collapse, cyanosis and dyspnea. Operative Diagnosis: Mesenteric thrombosis; dark bloody fluid, gangrenous bowel. Enterostomy. Death of patient. No autopsy.

Case 17. Dr. W. R. Jackson, Mobile, Ala. E J., white, male, age 30. Diagnosis: Intestinal obstruction. Pain marked, general, 36 hours' duration; tenderness marked, right side. Indefinite mass on right side. Nausea and progressive vomiting; bowels constipated. Distension early and extreme. Temp. subnormal up to 105°; pulse weak, up to 140. Operative Diagnosis: Mesenteric thrombosis; serous fluid, gangrenous bowel. Enterostomy and drainage. Death of patient. No autopsy.

Case 18. Dr. Wm. M. Mastin, Mobile, Ala. H., white, male, age 25. Clinical Diagnosis: Mesenteric thrombosis. Pain intense in umbilical region and radiating later, began early and continued; marked median tenderness. No mass palpable. Nausea and vomiting; tenesmus and constipation. Moderate distension. Temp. normal and subnormal; pulse rapid and feeble. Operative Diagnosis: Mesenteric thrombosis; sanguinolent fluid, gangrene of 2½ to 3 feet of small intestine. Resection of bowel. Patient died in short time. Autopsy verified findings at operation.

Case 19. Dr. Wm. M. Mastin, Mobile, Ala. White, male, age 35. Clinical Diagnosis: Intestinal obstruction. Pain early, extreme, median and radiating over abdomen. Marked median tenderness. Tumor in median line. Nausea and vomiting; tenesmus and constipation. Moderate distension. Temp. normal and subnormal; pulse rapid and feeble. Operative Diagnosis: Mesenteric thrombosis; sanguinolent fluid, paretic bowel, six inches commencing gangrene. Resected gangrenous intestine. Patient cured.

Case 20. Dr. F. Webb Griffith, Asheville, N. C. B. G. T., white, male, age 45. Clinical Diagnosis: Fecal impaction. Pain severe in upper left abdomen for 3 to 4 days. Mass size of fist in left hypochondrium, region of splenic flexure of colon; moderate tenderness over mass. Nausea and vomiting for two days; bowels constipated; moderate distension. Temp. about 100°; pulse 120. Operative Diagnosis: Mesenteric thrombosis. Small amount of fluid; intestine gangrenous for 12 inches. Did a lateral anastomosis. Patient died in short time. No post mortem obtained.

Case 21. Dr. George R. White, Savannah, Ga. Mrs. S. W., white, female, age 42. Previous History: Had been operated upon two months previously for hemorrhoids by clamp and cautery method; this followed by "milk leg." No clinical diagnosis. Pain intense over abdomen; marked general tenderness. Indefinite mass in left side, not always felt. Nausea and vomiting; diarrhea and melena. Moderate, early distension. Temp. about 101°; pulse rapid and feeble. Patient delirious all the time; collapse. No operation. Post mortem showed sero-purulent fluid; gangrene of six feet of small intestine due to thrombosis of mesenteric veins.

Case 22. Dr. L. E. Burch, Nashville, Tenn. During attack of typhoid fever patient suffered with pain, shock, and subnormal temp., with considerable distension of abdomen. Diagnosis: Intestinal perforation. Operation, however, disclosed a gangrenous condition of almost entire ileum, due to mesenteric thrombosis. No attempt was made to resect on account of desperate condition of patient, and he died in about two hours.

Case 23. Dr. L. E. Burch, Nashville, Tenn. Man. Two years previously had an operation for removal of appendix and drainage of gall bladder. Symptoms in this attack were shock, intense abdominal pain, subnormal temp., and abdominal distension. Operation disclosed a gangrenous condition of six feet of small intestine. Resection was done, but patient died in twelve hours.

Case 24. Dr. Louis Frank, Louisville, Ky. Young child; nothing in history. Clinical Diagnosis: Mesenteric thrombosis. Pain, distension, tenderness and melena were present. Abdominal section showed bloody fluid, and gangrenous intestine. Resection impossible on account of extensive involvement. Patient died four days later.

Case 25. Dr. Louis Frank, Louisville, Ky. Child. Diagnosis: Appendicitis, on account of usual symptoms. Operative Diagnosis: Mesenteric thrombosis. Bloody peritoneal fluid; extensive gangrene of intestine. No resection attempted. Patient died in 24 hours.

Case 26. Dr. Lee Kahn, Louisville, Ky. D. G., white, male, age 44. Nothing in previous history. Clinical Diagnosis: Intestinal Obstruction. Pain moderate, in left umbilical and lumbar re-

gions; moderate tenderness in left abdomen. No mass palpable. Vomiting, bowels constipated, no blood. Great general abdominal distension. Temp. subnormal, pulse 144. Marked exhaustion. Operative Diagnosis: Mesenteric thrombosis. Free bloody serum;. gangrenous intestine. Resection was done, but patient died following day. No post mortem obtained.

Case 27. Dr. J. G. Sherrill, Louisville, Ky. "Have seen only one case, some years ago. It accompanied a severe form of hemophilia from which patient promptly died, without operative interference. It was a City Hospital case and I am unable to give details. Symptoms were greatly masked by general condition."

Case 28. Dr. G. A. Hendon, Louisville, Ky. Case reported in "Louisville Monthly Journal of Medicine and Surgery," July, 1905. (Following is abstract of case.) White, male. Seen on 16th day of illness. Patient very weak, emaciated, eyes sunken, tongue dry with red edges. Pulse 110, full and strong; temp. 102°, respiration 40, short and labored. Constant cough, slight red-streaked sputum. Consolidation of lower lobe of right lung, bronchial breathing and crepitant rales. Bowels had moved each day. No nausea or vomiting. Abdominal distension extreme, with sulcus above umbilicus dividing abdomen transversely. Marked protrusion of umbilicus. Tenderness marked in right hypochondrium. Pneumonia underwent resolution in three to four days. Patient gradually became more exhausted. Umbilicus became more prominent with red zone about it. On 23rd day rupture of umbilicus occurred, with escape of large quantity of gas, hissing sound, followed by large quantity of liquid feces. There was sloughing of margin of umbilicus, and it continued to discharge gas and feces. Patient died three days later. Autopsy: Entire great omentum was gangrenous, and formed a ridge just above umbilicus. Small intestine adherent about umbilicus, and on separating these adhesions found many areas of discoloration of intestine corresponding to areas of infarction in mesentery, with thrombi present in mesenteric vessels. Appendix and cecum were blackened, gangrenous, but no pus was present. Mesenteric lymph glands enlarged. No thrombosis of portal vein. Spleen enlarged. Kidney, gall bladder and urinary bladder not involved.

Case 29. Dr. J. K. W. Piper, Russellville, Ky. Mrs. A. S., white, female, age 25. Mother of two children, version required in each delivery. Is 5 feet 2 inches tall, weighs about 145 pounds. In fourth month of third pregnancy was very tender over right "ovary," but no enlargement on abdominal or vaginal examination. Did not see her again until called to attend her in confinement. A long, tedious labor, and version required. After delivery, found a mass in right half of abdomen, seemed to be at right cornu of uterus. Advised an early operation, but it was refused. As uterus involuted this mass came lower, following uterus, but gradually increased in size, and in three months was six inches long. She was then operated upon by Dr. M. C. McGannon, of Nashville, Tenn. Mass was found to consist of appendix, which had been destroyed, right ovary which was mass of necrotic tissue, and hepatic flexure of colon, which had become adherent to mass in pregnancy and pulled down with uterus. Patient had severe shock, and made slow tedious recovery, but was improving, about five weeks after operation, when she had sudden collapse which required opening of abdomen. Found nine feet of ileum and colon black, due to mesenteric embolism. Resection of gangrenous intestine was done. Patient gradually recovered, and in six weeks more was sitting up and ready to return home when she suddenly developed cerebral embolism or acute meningitis and died in two days. There was no valvular lesion of heart present.

Case 30. Dr. H. R. Shands, Jackson, Miss. Clinical Diagnosis: Acute surgical abdomen. Marked distension and evidence of obstruction. Thrombosis and gangrene of intestine. Resected five feet of intestine. Patient died promptly.

Case 31. Dr. H. R. Shands, Jackson, Miss. Distension and evidences of obstruction. Almost entire small intestine found gangrenous. No operation attempted. Patient died quickly.

Case 32. Dr. E. A. Balloch, Washington, D. C. Hospital case, almost moribund, in which we found gangrene of two or three feet of small intestine.

Case 33. Dr. E. A. Balloch, Washington, D. C. Clinical diagnosis of ptomaine poisoning from general pain, vomiting, diarrhea and collapse. No operation, but autopsy showed mesenteric thrombosis.

Case 34. Dr. W. B. Thorning, Houston. Tex. (This case report submitted since paper was read. Details not included in summary.—Author.) A. K., white, male, age 42, laborer. F. H. Neg. P. H. Two unsuccessful attempts at radical cure of left inguinal hernia. P. I. Two hours after his usual light breakfast, was seized with very violent epigastric pain; shortly afterward vomited small amount of gastric contents, but no food. A physician was summoned, who administered hypodermic of morphine and ordered him conveyed to his home. No further vomiting. Another hypodermic at noon and another at 4 p. m. failed to do more than partially alleviate his suffering. A diagnosis of "acute surgical abdomen" was made and he was conveyed to Baptist Hospital, where he was seen in consultation with Drs. Hoeflich, Goar, Stokes and Patterson at 8 p. m., twelve hours after onset.

P. E. negative except a moderately distended abdomen. The abdominal muscles showed considerable resistance to deep palpation, but no rigidity. No dullness was noted and no mass could be detected. Temperature, which had been sub-normal all day, was 102° F. Pulse 120, W. B. C. 29,500. Polys 96%. Urine negative.

Diagnosis lay between perforation of duodenal ulcer, mesenteric thrombosis and acute pancreatitis. Exploration through a midrectus incision showed extensive thrombosis in mesentery of ileum, and six feet and one inch were resected. A safe margin of distal end left only one inch proximal to the ileo-cecal valve and in conse-

quence an end to side anastamosis with the ascending colon was made.

Post-operative recovery was interrupted on the fourth day by severe abdominal pain lasting several hours, with vomiting and marked symptoms of collapse. Twelve hours later dressings were saturated with drainage which was largely pancreatic secretion. This discharge was profuse for two days, but practically ceased in three days. On the 9th day of his convalescence he was again attacked with abdominal pain, which was more or less severe for 24 hours, and again he had marked prostration with rapid, feeble pulse and subnormal temperature.

On the 10th day the discharge became more fecal in character and it was feared that the anastamosis had given way.

Death occurred on the 16th day from general toxemia and inanition.

Post-mortem examination showed a perforation in the jejunum about 3½ inches from its point of exit from under root of mesentery. This was completely sealed by becoming adherent to the anterior abdominal wall. At a point about 4 inches from the terminal portion of the ileum was a large perforation with ragged sloughing edges extending back fully a quarter of an inch from the margins. There had evidently been a slight leak at the anastamosis as a small abscess, holding about one ounce, was found just beneath it.

The following two cases (Nos. 35 and 36) are reported, although the diagnosis was only clinical, not being verified by operation or autopsy.

Case 35. Dr. S. T. Earle, Baltimore, Md. H. V. W., white, male, age 67. Had operation for multiple external thrombotic hemorrhoids. Developed dull, heavy pain in rectum, and rectal tenderness. Swelling on posterior rectal wall and to left. Nausea and vomiting for last 12 hours. Several large, watery stools. Distension early but not marked. Temp. 101° for 48 hours, subnormal last six hours; pulse very rapid and feeble. Collapse. Patient died three days after operation for hemorrhoids. No post mortem permitted, but probable diagnosis of mesenteric thrombosis made by Dr. J. M. T. Finney, who saw patient.

Case 36. Dr. Cyrus Graham, Henderson, Ky. E. A., white, male, age 47. Clinical Diagnosis: Mesenteric thrombosis. Patient had intense abdominal pain, radiating to left. Marked tenderness, distension. Vomiting; bloody diarrhea Temp. 104.5°, pulse 130. Patient died in two days. No post mortem obtained, only clinical diagnosis.

SUMMARY

In the above case reports, 33 were diagnosed or confirmed by operation or autopsy, the other two being clinical diagnoses.

ETIOLOGY

Color.—Of the 33 cases the color was stated in 23, 22 of them being white and one black.

Sex.—The sex was stated in 22, 17 males and 5 females.

Age.—The ages were from 24 to 59; four 24 to 29; five 30 to 39; nine 40 to 49; one 59.

One case, age 24, operated upon two months previously for hemorrhoids (clamp and cautery) followed by "milk leg." One case, age 35, developed symptoms day after operation for appendicitis. Three cases, ages 45, 59 and one not stated, had hernia,—two strangulated and one reducible. The strangulated cases both had been reduced spontaneously without cessation of symptoms. One case, age 32, had slight blow on abdomen three days previously. One case, age 25, had mild sepsis following abortion three weeks previously. One case, age 48, had marked arteriosclerosis and aneurism of arch of aorta involving innominate; also valvular lesion of heart. One case, age 45, had hyperthyroidism and phlebitis. In one case the condition occurred during an attack of typhoid fever. Hemophilia was present in one case. In another case the man had been operated upon two years previously for appenditicis and drainage of gall bladder.

CLINICAL DIAGNOSIS

In 25 cases in which a clinical diagnosis was made we find the following, viz: Intestinal obstruction in 10 cases, mesenteric thrombosis in three cases, and suspected mesenteric thrombosis in one. Strangulated hernia and "acute surgical abdomen" were pronounced in two cases each. The following diagnoses were made in one case each: Appendicitis, appendicitis and peritonitis, peritonitis, acute hemorrhagic pancreatitis, fecal impaction, intestinal perforation in typhoid, and ptomaine poisoning.

SYMPTOMS AND SIGNS

Pain.—We note that pain is mentioned in 26 of the 33 cases,—every case in which any clinical history is given. It is described as cramp-like, severe, extreme, intense, and agonizing. It was localized in the epigastrium in two cases, lower abdomen in one, about umbilicus in four, to left of umbilicus, left half of abdomen in three

cases, to right of umbilicus and above in two cases, median in one case, and general in ten cases. In three instances the pain was defined as localized at first, becoming general later. In one instance as general at first, localizing in lower abdomen later.

Tenderness.—In 20 cases this is located as follows: Six general, 6 right side, 2 left side, 2 median, 2 lower abdomen, 1 epigastric, and 1 at umbilicus and lower abdomen.

Tumor.—The presence of a mass is defined as follows in seven cases, viz: movable dullness, to right and above umbilicus, indefinite on left, median, and left hypochondriac in one each, and in two cases as indefinite on right. In seven cases it is noted that no mass was present.

Gastro-Intestinal Symptoms. — Vomiting is mentioned alone in seven cases; nausea and vomiting in 12. The vomitus is described as bile-stained in 3 cases, as bile and fecal matter in 2, and as bloody in 1. The bowels were constipated in 10 cases. Absolute constipation in 3 cases, constipated but can be moved in 1 case, tenesmus and constipation in 2, melena in 1, melena followed by constipation in 1, and diarrhea and melena in 1. Distension is mentioned in 27 cases: general in 10, moderate in 10, slight in 2, extreme in 7, early in 3, and late in 1. Its absence is noted in 1 case. Muscular rigidity is mentioned in four cases.

Pulse and Temperature.—A study of the temperature shows that in most cases it is normal or subnormal (15 of 21 cases noted) early in the attack, but may rise to 104 or 105°, if progress of case is not too rapid. Late in the attack, with the collapse, the temperature frequently becomes subnormal again. The pulse rate is almost always above 110 to 120, frequently 140 to 150.

Leucocytosis.—In the three cases in which the leucocyte count was recorded it was as follows: Increased from 5,000 to 31,000 after admission (4 days), 28,000, and 21,000.

OPERATION

Peritoneal Fluid.—In 20 cases the fluid was described and in one it was noted that there was no exudate. In two cases it was described as clear serous fluid; in four as sero-purulent fluid, two of them having a fecal odor; and in the remaining 14 as bloody, black or dark fluid.

Intestine.—In 32 of the 33 cases reported the condition of the intestine is described in one as commencing gangrene and in the remainder as gangrenous, black or bluish bowel. In one case (No. 5) there was gangrene of the omentum. As to location of gangrenous intestine, it involves in one case (No. 29) the colon and ileum, and is described as embolism; and in another (Case No. 28) the cecum and appendix being black in addition to numerous areas of gangrene in the ileum. In the remaining 30 cases the lesion was in the ileum.

Character of Lesion.—In only the one case (No. 29) is the lesion defined as embolism, the remainder being described as thrombosis of the veins or arteries.

Extent of Lesion.—The amount of intestine involved was from 3 or 4 inches to almost the entire ileum, as follows: 3 to 4 inches, 6 inches, 12 inches (2 cases), 2 to 3 feet (4 cases), 4½ feet (2 cases), 5 feet, 6 feet (2 cases), 6½ feet, 9 feet, several feet, and almost the entire ileum (3 cases).

Operative Procedure.—In six cases the area of involvement was so great that no operation could be done on account of the desperate condition of the patient, all of these dying. In two more cases the diagnosis was made at autopsy, no operation having been done. In one case (No. 5) the loop was brought out of the wound and excised (3 to 4 inches) the following day, the ends being drained and death following in four days. In four cases an enterostomy was done, each end of the intestine being drained with rubber tubes. In each case the patient died, one of them showing five feet of gangrenous ileum at autopsy. In 18 cases a resection of the gangrenous bowel was done; in some cases the ends were closed and lateral anastomosis done; but in most cases with more extensive lesions a lateral anastomosis was done and the ends of the bowel were left out of the wound and drained. In one of the resections (Case 3) a second thrombosis occurred on the 5th day and the patient survived only nine hours. In another (Case 7) a second operation was required on the 17th day on account of a

quence an end to side anastamosis with the ascending colon was made.

Post-operative recovery was interrupted on the fourth day by severe abdominal pain lasting several hours, with vomiting and marked symptoms of collapse. Twelve hours later dressings were saturated with drainage which was largely pancreatic secretion. This discharge was profuse for two days, but practically ceased in three days. On the 9th day of his convalescence he was again attacked with abdominal pain, which was more or less severe for 24 hours, and again he had marked prostration with rapid, feeble pulse and subnormal temperature.

On the 10th day the discharge became more fecal in character and it was feared that the anastamosis had given way.

Death occurred on the 16th day from general toxemia and inanition.

Post-mortem examination showed a perforation in the jejunum about 3½ inches from its point of exit from under root of mesentery. This was completely sealed by becoming adherent to the anterior abdominal wall. At a point about 4 inches from the terminal portion of the ileum was a large perforation with ragged sloughing edges extending back fully a quarter of an inch from the margins. There had evidently been a slight leak at the anastamosis as a small abscess, holding about one ounce, was found just beneath it.

The following two cases (Nos. 35 and 36) are reported, although the diagnosis was only clinical, not being verified by operation or autopsy.

Case 35. Dr. S. T. Earle, Baltimore, Md. H. V. W., white, male, age 67. Had operation for multiple external thrombotic hemorrhoids. Developed dull, heavy pain in rectum, and rectal tenderness. Swelling on posterior rectal wall and to left. Nausea and vomiting for last 12 hours. Several large, watery stools. Distension early but not marked. Temp. 101° for 48 hours, subnormal last six hours; pulse very rapid and feeble. Collapse. Patient died three days after operation for hemorrhoids. No post mortem permitted, but probable diagnosis of mesenteric thrombosis made by Dr. J. M. T. Finney, who saw patient.

Case 36. Dr. Cyrus Graham, Henderson, Ky. E. A., white, male, age 47. Clinical Diagnosis: Mesenteric thrombosis. Patient had intense abdominal pain, radiating to left. Marked tenderness, distension. Vomiting; bloody diarrhea Temp. 104.5°, pulse 130. Patient died in two days. No post mortem obtained, only clinical diagnosis.

SUMMARY

In the above case reports, 33 were diagnosed or confirmed by operation or autopsy, the other two being clinical diagnoses.

ETIOLOGY

Color.—Of the 33 cases the color was stated in 23, 22 of them being white and one black.

Sex.—The sex was stated in 22, 17 males and 5 females.

Age.—The ages were from 24 to 59; four 24 to 29; five 30 to 39; nine 40 to 49; one 59.

One case, age 24, operated upon two months previously for hemorrhoids (clamp and cautery) followed by "milk leg." One case, age 35, developed symptoms day after operation for appendicitis. Three cases, ages 45, 59 and one not stated, had hernia,—two strangulated and one reducible. The strangulated cases both had been reduced spontaneously without cessation of symptoms. One case, age 32, had slight blow on abdomen three days previously. One case, age 25, had mild sepsis following abortion three weeks previously. One case, age 48, had marked arteriosclerosis and aneurism of arch of aorta involving innominate; also valvular lesion of heart. One case, age 45, had hyperthyroidism and phlebitis. In one case the condition occurred during an attack of typhoid fever. Hemophilia was present in one case. In another case the man had been operated upon two years previously for appenditicis and drainage of gall bladder.

CLINICAL DIAGNOSIS

In 25 cases in which a clinical diagnosis was made we find the following, viz: Intestinal obstruction in 10 cases, mesenteric thrombosis in three cases, and suspected mesenteric thrombosis in one. Strangulated hernia and "acute surgical abdomen" were pronounced in two cases each. The following diagnoses were made in one case each: Appendicitis, appendicitis and peritonitis, peritonitis, acute hemorrhagic pancreatitis, fecal impaction, intestinal perforation in typhoid, and ptomaine poisoning.

SYMPTOMS AND SIGNS

Pain.—We note that pain is mentioned in 26 of the 33 cases,—every case in which any clinical history is given. It is described as cramp-like, severe, extreme, intense, and agonizing. It was localized in the epigastrium in two cases, lower abdomen in one, about umbilicus in four, to left of umbilicus, left half of abdomen in three

cases, to right of umbilicus and above in two cases, median in one case, and general in ten cases. In three instances the pain was defined as localized at first, becoming general later. In one instance as general at first, localizing in lower abdomen later.

Tenderness.—In 20 cases this is located as follows: Six general, 6 right side, 2 left side, 2 median, 2 lower abdomen, 1 epigastric, and 1 at umbilicus and lower abdomen.

Tumor.—The presence of a mass is defined as follows in seven cases, viz: movable dullness, to right and above umbilicus, indefinite on left, median, and left hypochondriac in one each, and in two cases as indefinite on right. In seven cases it is noted that no mass was present.

Gastro-Intestinal Symptoms. — Vomiting is mentioned alone in seven cases; nausea and vomiting in 12. The vomitus is described as bile-stained in 3 cases, as bile and fecal matter in 2, and as bloody in 1. The bowels were constipated in 10 cases. Absolute constipation in 3 cases, constipated but can be moved in 1 case, tenesmus and constipation in 2, melena in 1, melena followed by constipation in 1, and diarrhea and melena in 1. Distension is mentioned in 27 cases: general in 10, moderate in 10, slight in 2, extreme in 7, early in 3, and late in 1. Its absence is noted in 1 case. Muscular rigidity is mentioned in four cases.

Pulse and Temperature.—A study of the temperature shows that in most cases it is normal or subnormal (15 of 21 cases noted) early in the attack, but may rise to 104 or 105°, if progress of case is not too rapid. Late in the attack, with the collapse, the temperature frequently becomes subnormal again. The pulse rate is almost always above 110 to 120, frequently 140 to 150.

Leucocytosis.—In the three cases in which the leucocyte count was recorded it was as follows: Increased from 5,000 to 31,000 after admission (4 days), 28,000, and 21,000.

OPERATION

Peritoneal Fluid.—In 20 cases the fluid was described and in one it was noted that there was no exudate. In two cases it was described as clear serous fluid; in four as sero-purulent fluid, two of them having a fecal odor; and in the remaining 14 as bloody, black or dark fluid.

Intestine.—In 32 of the 33 cases reported the condition of the intestine is described in one as commencing gangrene and in the remainder as gangrenous, black or bluish bowel. In one case (No. 5) there was gangrene of the omentum. As to location of gangrenous intestine, it involves in one case (No. 29) the colon and ileum, and is described as embolism; and in another (Case No. 28) the cecum and appendix being black in addition to numerous areas of gangrene in the ileum. In the remaining 30 cases the lesion was in the ileum.

Character of Lesion.—In only the one case (No. 29) is the lesion defined as embolism, the remainder being described as thrombosis of the veins or arteries.

Extent of Lesion.—The amount of intestine involved was from 3 or 4 inches to almost the entire ileum, as follows: 3 to 4 inches, 6 inches, 12 inches (2 cases), 2 to 3 feet (4 cases), 4½ feet (2 cases), 5 feet, 6 feet (2 cases), 6½ feet, 9 feet, several feet, and almost the entire ileum (3 cases).

Operative Procedure.—In six cases the area of involvement was so great that no operation could be done on account of the desperate condition of the patient, all of these dying. In two more cases the diagnosis was made at autopsy, no operation having been done. In one case (No. 5) the loop was brought out of the wound and excised (3 to 4 inches) the following day, the ends being drained and death following in four days. In four cases an enterostomy was done, each end of the intestine being drained with rubber tubes. In each case the patient died, one of them showing five feet of gangrenous ileum at autopsy. In 18 cases a resection of the gangrenous bowel was done; in some cases the ends were closed and lateral anastomosis done; but in most cases with more extensive lesions a lateral anastomosis was done and the ends of the bowel were left out of the wound and drained. In one of the resections (Case 3) a second thrombosis occurred on the 5th day and the patient survived only nine hours. In another (Case 7) a second operation was required on the 17th day on account of a

fecal fistula, and the patient died from shock in six hours.

In Case 29, the patient recovered from the resection for the mesenteric embolism and died in about six weeks from cerebral embolism, so we feel that this should be considered a recovery. In two cases no operative procedure is mentioned.

In the three cases which recovered we note the following facts:

Case 1.—Resection of 2 to 2½ feet of affected bowel, ends closed, lateral anastomosis, wound closed; gradual recovery.

Case 13.—Resected three feet of gangrenous intestine, closed ends of bowel, lateral anastomosis by Murphy button; patient cured.

Case 19.—Paretic bowel, 6 inches commencing gangrene; resected gangrenous intestine; patient cured. In the 23 cases which were subjected to operation there were four recoveries, 17.4%. In addition to the above cases of mesenteric occlusion we received the reports of ten cases seen by three different surgeons, two having three cases each and one having seen four cases. The only statement regarding any detail was of one surgeon who said that two of his cases had been diagnosed appendicitis. An inquiry regarding the number of cases operated upon and the responses of twenty-five surgeons led us to believe that this total of 45 cases occurred in from 40,000 to 50,000 abdominal cases, or approximately one in 1,000. A further inquiry as to proportion of abdominal to total surgical cases shows them to be about 1 to 3; so that we may judge that mesenteric occlusion occurs about once in 3,000 surgical cases. In addition to the cases of mesenteric occlusion reported above, we received histories of two cases seen by two surgeons now in the South, but these cases were seen one in the East and one in Panama, so that they are not included herewith. We also received reports of other lesions of mesentery and omentum as follows; gangrene of omentum, torsion of omentum, hematoma of mesentery, multiple abscesses of mesentery, and primary tuberculosis of mesenteric glands, which for obvious reasons have not been included.

CONCLUSIONS

Occlusion of the mesenteric vessels is a relatively infrequent condition, occurring about once in 1,000 abdominal operations.

Age seems to have a bearing upon the condition, most of the cases occurring after the thirtieth year. As to sex, it is about twice as frequent in males as in females. In our series of 34 cases (including personal case) there was only one Negro, the remainder being white.

So far as previous operative procedures are concerned, we are led to believe that it is a combination of trauma and infection, although there has not been present in every case unmistakable evidence of pyogenic infection.

In only four of this series of 34 cases was the diagnosis made or even suspected. Hence we may assume that the clinical picture is by no means complete. The order of frequency of the different symptoms was as follows: distension, pain, tenderness, pulse and temperature ratio, nausea and vomiting, constipation, tumor, and melena. It is worthy of note that melena, which is considered characteristic of this condition, was present in only three cases. Most of these symptoms varied as to time of onset, localization, radiation, duration. etc.

Apparently the ideal method of treatment consists in resection of the intestine, with an end-to-end or lateral anatomosis, and closure of the abdomen; but the recoveries occurred after this method on account of the small amount of intestine involved rather than from the particular technic used. In the cases with more extensive destruction of intestine, the drainage must be used after the anastomosis, or without it in extreme cases.

Finally, we hereby desire to express our sincere appreciation of the hearty response on the part of the many surgeons throughout the South who so readily and willingly contributed to the making of this paper.

BIBLIOGRAPHY

Since the paper by Jackson, Porter and Quinby, Jour. Am. Med. Assoc., 1904, June 4, July 2, 9 and 16, the most complete and exhaustive study of this condition is found in the monograph, "Embolism and Thrombosis of the Mesenteric Vessels," by L. B. C. Trotter, Cambridge, at the University Press, 1913. This includes the reports of seven original cases with a review of 366 cases from the literature. There is a full discussion of the morbid anatomy, animal experiments, symp-

toms, diagnosis and treatment, followed by a complete bibliography, up to date of publication.

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DISCUSSION

Dr. J. Shelton Horsley, Richmond, Va.—The etiology of thrombosis and embolism of the mesenteric vessels is very interesting but rather vague. There are some instances in which we can suspect a foreign body, or the lodgment of material from the heart. Thrombosis of the veins of the leg, such as "milk leg," or phlebitis, is a rather common occurrence after typhoid, pregnancy, or any acute illness, and sometimes occurs independently. When we can not explain such a condition, which is under immediate observation, we can hardly account for all cases of thrombosis of the mesenteric vessels. The large amounts of toxic and septic material in the blood as well as organic lesions of the heart are undoubtedly predisposing causes to thrombosis and embolism of the mesenteric vessels.

I have had two cases of thrombosis of the mesenteric vessels. One, a child, who was operated upon for what appeared to be general peritonitis. On opening the abdomen all the small intestines appeared to be gangrenous, and the child died on the table. A second case followed the reduction of a hernia, and a loop of about eight inches of intestine was black and gangrenous. I resected it and did an end-to-end union, but I did not remove enough intestine, as a fecal fistula followed from the free border. The patient became marasmic, necessitating another operation some weeks later, which was followed by death. I believe the essential feature in such cases is to remove a large amount of intestine on each side of the affected loop, and if the intestine does not bleed well at this point, still more should be taken. It may look healthy and have just enough nutrition for ordinary wear and tear and not be able to stand the additional burden of repair after resection. Two or three feet of intestine, more or less, do not seriously affect the nutrition.

I was much impressed by the cramp-like, severe pains in the second case and by the extreme rigidity. There were also bloody stools. I believe the absence of fever, the intense rigidity and pain, together with a careful blood count, may be helpful in the diagnosis of these cases.

Dr. Thomas Ragen, Shreveport, La.—Some years ago I saw a case of a five-year-old child who had an infantile paralysis from which it did not make a very good recovery. I saw the child earlier and did not offer a very good prognosis and the parents did not have me treat it.

An osteopath promised to cure the child and was rather slow in doing it, and the day previous to this attack he gave some osteopathic calomel,—he pounded and crushed the liver very much. The child went to bed after the treatment.

I was not the family physician and was called in consultation the next day. I saw the child in almost a dying condition and had it taken to the hospital at once. I told the parents I did not believe anything would save it, but I opened the abdomen to see if I could. A number of feet of the intestine were black; and the veins and arteries were occluded,—a typical case of its kind. The patient died on the table. I was trying to put in drainage and bring the ends where it would drain. The osteopath really produced the lesion.

Dr. F. Webb Griffith, Asheville, N. C.—I have seen only one case and in that the diagnosis of fecal impaction had been made when I first saw him. I was called at 4 o'clock one morning and found a man about 45 years old with a mass the size of a fist in the upper left quadrant of the abdomen. The mass was slightly movable and not very tender. The patient had had a mild gastro-intestinal upset for a few days and for two days had had symptoms of partial obstruction of the bowels. At the time I saw him he was vomiting, the pulse rate was increasing, temperature about 100°, and he was definitely toxic.

We operated immediately at the home and found about 18 inches of gangrenous bowel. We did an anastomosis of the healthy bowel above and below the gangrenous area. The patient was on the table about twenty-five minutes. After the operation he got definitely better for a few hours, and seemed to be eliminating nicely. However, about ten hours after the operation he began to sink rapidly and died in two hours.

There is one thing we must urge on every occasion, and that is in acute abdominal conditions purgatives are absolutely contra-indicated. There are ten made worse to every patient helped by giving purgatives in such cases.

Dr. Homer S. Bruce, Opelika, Ala.—My first case involved a perineum. The patient was operated upon and reacted very quickly; and on the third day there were symptoms of ileus. The symptoms of obstruction progressed until I opened the abdomen and found a gangrenous ileum. In this instance the tumor was very large and involvement of the perinephritic tissue was such that clamps were used very freely; and large masses of tissue were taken in the clamps.

The next case followed a Kraske operation. In about two days there was ileus. Reviewing some literature upon the subject, and upon inquiry of other surgeons, I found that the majority of those instances in which they reported these mesenteric embolisms were in cases where clamps were used very freely in operations,—several of them for strangulated hernia,—where there had been strangulated tissue. I therefore concluded that those two cases of mine might have been saved had the dissection been carried further beyond the clamps. Possibly some of the larger veins were involved and the blood clots were left in them.

Since then I have been doing free dissection of all strangulations; and where I use clamps I dissect away all tissue included in the clamp as far as possible. In strangulated hernia, I carry my work far enough to see that in the omentum the circulation is intact, and that I leave no occluded blood vessels.

Of course my experience covers only two cases, and we could not reason from them. But I would like to ask the essayist in his report what proportion of cases were hernias, and whether or not they were clamp operations?

Dr. Chas. H. Harris, Fort Worth, Tex.—This in-

terests us all as surgeons and those of us doing abdominal work in this way: it teaches us the importance of being able to recognize early a surgical abdomen, and also of being able to take care of a situation when once inside the abdomen.

I have had the misfortune of seeing two cases of obstruction of the mesenteric circulation. One of these was a boy fourteen years of age, whose condition was dignosed acute appendicitis with a perforation, and was sent to the hospital for operation. The patient reached the hospital in extremis. Only under the persistent efforts of the doctor, the father and the son, were we persuaded to open the abdomen. We found everything perfectly gangrenous; closed it; and in about twelve hours the patient died. Post mortem showed obstruction by clot.

The fifth day after the bowel was removed, in another case, the patient developed a surgical abdomen. It was opened and a portion of the sigmoid flexure and descending colon was gangrenous. This patient died.

The point I learned from that was this. Opening an abdomen and finding a gangrenous condition without possibility of obstruction would now lead me to seek for the obstruction of the circulation. Consequently, I believe that the lesson will be worth something to me in the future.

Dr. Ira C. Chase, Fort Worth, Tex.—I have been waiting for some one to say something about what, to me, has been the most important explanatory factor in this mesenteric thrombosis. But unfortunately not having heard the entire paper, I can not say it was not mentioned.

I have recently resected four feet four inches of gangrenous intestine, the specimen showing, to my mind, one of the common causes of mesenteric thrombus, while there seemed to be no cause which might have existed from infection, ordinary inflammation, hernia, strangulated hernia, etc. We know the common cause of death in stangulated hernia and strangulated thrombosis. This was intussusception with a large gangrenous area in the bowel. It is my impression, and I leave it to you that where there is no apparent cause for such a sudden attack, many of these obstructions are unrecognized intussusception.

Dr. A. Jacoby, Dallas, Tex.—I think it is better to pull out the small bowel, cut off the involved portion, stick a large sized tube in either end of the intestine, and drain at both ends for a week. Then if the patient is alive, do an anastomosis. It is wise to place a catheter in the upper end of the bowel, no matter what method one pursues, and drain away all infected material in the small bowel. They often die, not from the condition that has produced the thrombosis nor the shock so much as from the absorption of toxic material from the small bowel.

Dr. Blackburn (closing).—It just occurred to me while Dr. Horsley was talking that some people had 300% mortality rather than Dr. Horsley's 200%.

I did not go into the discussion of the different theories that had been advanced as to causation, because I found after writing up somewhat in detail the histories of thirty-five cases that the paper became too voluminous to think about going into all of those things.

I feel that there is in all of these operative cases particularly a combination of trauma and the toxic element,—not necessarily pyogenic. It is along the line of the theory advanced by Elliott in a recent number of the "Annals of Surgery" (November, 1915).

Trotter describes one case developing in suppurative appendicitis with a gangrenous appendix. There was a thrombus of a vein in the abscess wall. He dissected it out carefully, followed it upward through the veins, and in that way found the thrombus coming directly from the vein of the wall of the abscess cavity and up to the mesenteric veins.

One important question is, if the toxic element enters, why do not we have thrombosis frequently in typhoid fever? In only one case that I report here in this series of thirty-five did it occur in typhoid fever. The diagnosis in that instance was made of perforation during typhoid, and yet there was a rather extensive area of bowel gangrenous, and nothing was attempted.

As to the operative procedure which I discussed somewhat at length in my paper, the cases that have recovered were those in which there was a resection, a closure of the ends of the intestine with a lateral anastomosis, and closure of the abdomen. I am inclined to believe that those patients recovered on account of the fact that the local condition was limited. My personal opinion is that in all those cases where there is a very extensive involvement, the technique suggested by some one a moment ago of resecting and bringing the two ends of the intestine out of the abdominal wound and draining each end, is the best, and ought to be used in all such cases.

INJURIES OF THE URINARY TRACT.*

By Howard J. Williams, A.M., M.D.,
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During an experience of thirty-two years in attending various medical meetings, many of which were meetings of railroad surgeons, the writer can not recall a single meeting at which the question of traumatism of any portion of the urinary tract has ever been discussed. This fact is rather remarkable, since these injuries are not uncommon in the various accidents of civil life and in the multiplicity of casualties resulting from the operation of railroad industries.

In the preserved records of the writer's personal surgical work during thirty-three

*Read before Central of Georgia Railway Surgeons' Association.

years, there are clinical histories of fourteen injuries of the urinary tract; five of these wounds having been received by victims of railroad accidents; five were due to fire arms; and four were due to other accidents in private life. In these records there are three cases of pistol shot wound of the kidney, two cases of subparietal laceration of the kidney, two cases of pistol shot wound of the urinary bladder, five cases of subparietal laceration of the urinary bladder, and two cases of subparietal rupture of the deep urethra. In the following review of these cases the writer will divide the subject into three heads and five sub-divisions, appending in each a brief history of those cases illustrative of the subdivisions discussed.

WOUNDS OF THE KIDNEY.

Wounds of the kidney have been considered comparatively rare and yet the writer has seen five cases of this class. They were formerly regarded as very dangerous, but modern surgical interference has reduced their mortality. Prompt recognition of the presence of such wounds and early operation are necessary to successfully combat their danger. The great vascularity of these organs materially aids in the prompt repair of these lesions. Of the five cases in the writer's experience only one terminated fatally.

Injuries of the kidney are classed as open or subparietal. In the first class are included incised, stabbed, and gunshot wounds, due to sharp instruments or missiles, which show an external opening. In the second class are contused, lacerated or ruptured wounds of the organs, due to blows, falls or crushes, which show no external evidence of violence.

The general symptoms of kidney wounds are shock, pain, hematuria, localized swelling or tumefaction, and external evidence of traumatism, all varying with the degree of the violence inflicted. Shock depends not only upon the violence of the injury, but also upon the complications attending the traumatism. Crushing wounds involving other abdominal organs and gunshot wounds complicating the hollow viscera of course cause the greatest shock. Pain is not only local, but is also referred to the groin and to the external genitalia. Renal colic is frequently present. Hematuria varies with the extent of destruction of kidney tissue, and its time of onset depends upon the character of the traumatism. A stab wound may bleed promptly into the kidney and ureter. A laceration of the arteries within the pelvis of the kidney may cause a rapidly fatal hematuria. Tumefaction depends upon the extent of hemorrhage outside of kidney and urinary extravasation into the perinephritic tissues.

The complications of kidney wounds are intraperitoneal hemorrhage, traumatic nephritis, hydronephrosis, perinephritic abscess, pyelonephritis, and peritonitis.

Gunshot wounds of the kidneys, of which the writer has seen three cases, are said to be rare in civil life, and yet they are more commonly encountered than incised or stabbed wounds. The mortality is relatively high owing to complications arising from wounds of other abdominal solid and hollow viscera. Of the three gunshot wounds of the kidney recorded below, two recovered (one complicated with two perforations of the stomach, the other without any injury to the hollow or other abdominal viscera). The fatal case was complicated with perforation of the small intestines.

Hematuria is usually delayed in gunshot wounds of the kidney, unless a large renal vessel is injured, until the track of the missile sloughs. In one of the writer's cases, it was delayed eight days; in one it began in two hours and continued eleven days; and in the fatal case it did not appear at all. Referred testicular pain was present in two of the cases and absent in one. Death in gunshot wounds of the kidney is usually due to peritonitis from intestinal complications, perinephritic abscess and pyelitis.

R. T., male, 35 years of age, Negro, laborer, Nov. 27, 1897, Macon Hospital. Three pistol shot wounds, 38 calibre, right groin, left chest wall, and left side of abdomen laterally near costal border. Last ball, upon laparotomy found to have passed through upper part of left kidney and one part of the small intestine. Severe shock, intense pain in left testicle, nausea and vomiting, urine not bloody. Death on fifth day due to peritonitis.

B. B., male, 13 years of age, white, school boy, Oct. 6, 1901, Macon Hospital. Accidental pistol shot, 32 calibre, near left costal border in front. Laparotomy, ball passed through lesser and greater curvature of stomach and on through right kidney. Stomach wounds closed. Pain in

right testicle from time of accident. Bloody urine eighth day after accident. Recovery.

A. H., male, 28 years of age, white, stationary engineer, Aug. 11, 1903, Macon Hospital. Pistol shot in back near right third lumbar vertebra. Exploratory laparotomy, no intestinal lesion, lumbar drainage for kidney wound. No testicular pain, but bloody urine began two hours after wound and continued eleven days. Recovery.

Subparietal wounds of the kidney, of which the writer has seen two cases in their late complications, are said to be the most common of all traumatisms of these organs. They are due to falls, blows and crushing accidents. Neither of the following cases was due to railway injuries; one was due to a kick from a mule, the other due to a blow from a baseball bat. In these injuries the hematuria may vary with the degree of injury. In simple contusion it may be absent unless it comes on secondarily, depending upon infection and necrosis. In laceration it may be early yet not very marked; while in complete rupture it may be rapidly fatal. Renal colic and referred pain are usually present, and a rapidly growing tumor in the loin is very frequently observed. The two cases recorded gave histories of pain, hematuria and rapidly growing tumefaction. The prognosis in this class of cases is quite high, 30 to 50% die, usually from the late complications. Both of the writer's cases recovered after operation, one from perinephritic abscess, the other from a secondary hydronephrosis. The usual mortality is due either to rapidly fatal intra-abdominal hemorrhage, excessive hematuria or to secondary septic infection.

J. T., male, 19 years of age, white, baseball player, June 14, 1907, Macon Hospital. Struck accidentally by baseball bat over right loin three weeks before admission. Bloody urine third day after accident, testicular pain immediately after blow. Tumor in right loin rapidly developed, followed on tenth day by chills and fever. Right lumbar incision with discharge of pus and urine three weeks after accident. Recovery.

C. C. L., male, 30 years of age, white, farmer, May 9, 1910, Macon Hospital. Three months before admission kicked by a mule over right loin, followed by bloody urine, pain in right testicle and right loin lasting three days, with rapidly growing tumor in right side. Diagnosis, Traumatic hydronephrosis. Operation, right lumbar incision, exterpation of hydronephritic sac, removal of stump of kidney; drainage. Recovery.

WOUNDS OF THE URINARY BLADDER

Uncomplicated injuries of the bladder are rare. The protected position of the viscus, located as it is in the bony pelvis, shields it from direct injury by blows and falls, although it may be injured directly by penetrating instruments or bullets. Spontaneous rupture may, however, occur in over distension of a previously diseased bladder, or it may be produced by over distension by bladder injections. Injuries of the bladder are divided into penetrating wounds and subparietal ruptures. They are further subdivided into extraperitoneal or intraperitoneal injuries, depending upon the location of the wound to the bladder wall. Intraperitoneal injuries are always most serious. Penetrating wounds may be either incised, punctured or gunshot,—the vulnerating body being a knife, the horn of an animal, a blunt instrument, or a bullet.

Bladder injuries are generally complicated with injuries of either the bone, intestines, blood vessels, nerves, genitalia or other important tissues.

The cardinal symptoms of bladder injuries are shock (which may be variable in degree and not correspond with the severity of the lesion), suprapubic pain (which is usually present and is accompanied by tenderness on palpation in the hypogastric area), intense desire to urinate with little or no expulsive force, accompanied by tenesmus and escape of little or no urine, and bloody urine. Introduction of the catheter withdraws very little or no fluid. Another diagnostic test is the injection of a measured quantity of water into the bladder and its withdrawal to establish a possible leakage into the perivesical tissues or into the peritoneal cavity: this is a very dangerous measure and is only mentioned to be condemned.

The mortality of bladder wounds is very high, but modern scientific treatment has materially reduced the fatality of these lesions.

Gunshot wounds of the bladder are rare. The writer has as yet never encountered an incised or punctured wound, but has treated two cases of bullet wounds of the bladder; one an extraperitoneal wound, the other extra- and intra-peritoneal. Usually gunshot wounds are double, form-

ing a wound of entrance and a wound of exit as the missile traverses the viscus. There may, however, be only a single wound, as when the bullet cuts through only a small section of the bladder wall in its transit through the body. The writer's extra-peritoneal case illustrates the single wound condition. The points of entrance of the missile into the body and its entrance into the bladder may be widely separated, and before reaching the bladder wall other important organs, the intestines, large blood vessels, or nerves, may be fatally injured.

Besides the usual cardinal symptoms and signs of wounds of the bladder, there are to be considered in gunshot wounds the probable escape from the body of bloody urine following the track of the bullet, this symptom is only present when the wound of entrance is near the bladder region. There may also be an extensive tumefaction from urinary infiltration of the tissues in the suprapubic space. In laparotomies for gunshot wounds of the abdomen the presence of the odor of urine may lead to the discovery of a wound of the bladder. In all operations for gunshot wounds of the abdomen the surgeon should always examine the intra-peritoneal wall of the bladder for the reason that the general shock accompanying these injuries may be so severe that the symptoms pointing to wounds of the bladder may be overlooked.

The mortality of gunshot wounds of the bladder is usually very high, the fatal complications being shock and concomitant hemorrhage, wounds of other organs, peritonitis, and general septicemia. One of the writer's cases terminated fatally in thirty-six hours from peritonitis. The other case recovered.

P. B., male, 28 years of age, Negro, laborer, Nov. 29, 1902, Macon Hospital. Gunshot wound of right suprapubic region two hours before admission. Suprapubic pain, bloody urine on catheterization, shock. Laparotomy. Peritoneal cavity not involved. Extraperitoneal wound of bladder found and closed. Bullet found buried on left brim of pelvis. Permanent catheter in bladder, and drainage down to bladder wound. Recovery.

C. E. B., male, 40 years of age, white, farmer, Dec. 9, 1909, Macon Hospital. Three hours before admission shot in right inguinal region ranging internally and to left. Shock and bloody urine on catheterization, nausea, vomiting, suprapubic pain. Laparotomy; no intestinal lesion, two bladder wounds, one extraperitoneal and other intraperitoneal. Bloody urine in peritoneal cavity. Peritoneal wound of bladder closed and peritoneal cavity drained; extraperitoneal wound partially closed with suprapubic bladder drain and permanent catheter through urethra. Death in 36 hours.

Subparietal ruptures of the bladder are more frequently encountered than are penetrating injuries because of the greater frequency of falls, blows and crushing accidents directly to the pelvic region. In a large per cent of these injuries the bony frame work of the pelvis is broken and the ends of the fractured bone cut the bladder wall or project into its cavity, or the direct crushing violence may rupture the walls of the bladder covered alone by the peritoneum. These wounds are either extra-peritoneal, intra-peritoneal, or a combination of both. Extra-peritoneal rupture most frequently occurs. The writer has encountered five cases of subparietal rupture of the bladder, four were extra-peritoneal and the fifth a combination of extra- and intra-peritoneal injury. Extra-peritoneal rupture is not so dangerous as intra-peritoneal rupture.

The complications most frequently encountered in these injuries are fracture of the pelvic brim (most frequently the transverse or descending rami of the pubis), septic cellulitis and peritonitis. In all of the writer's cases fracture of the pelvis was present.

In addition to the general symptoms common to all wounds of the bladder, there are also indications which should be carefully looked for in subparietal injuries to locate the possible seat of the rupture of the viscus. In intra-peritoneal wounds the bladder is usually found empty very soon after the injury, and symptoms of rapidly developing peritonitis soon follow. In extra-peritoneal rupture some bloody urine is found on catheterization soon after the trauma, and there is a gradually developing tumefaction above the pelvic brim with slowly extending dullness spreading up over the lower anterior walls of the abdomen; this tumefaction is boggy on palpation and is often extremely tender to touch. If the urine is septic, from some previously existing cystitis, symptoms of general sepsis may soon develop. In all crushing injuries

about the pelvis and lower abdomen prompt examination for possible signs of rupture of the bladder should be made early, for the cardinal symptoms of pelvic pain and frequent desire to urinate with tenesmus may be delayed. The catheter should always be used in these cases. In one of the writer's cases, one in which the apparent traumatism was very slight (an automobile accident), and in which there was no apparent shock, suprapubic pain, nor bladder tenesmus, the passage of the catheter showed bloody urine.

The mortality of subparietal rupture is very high. In 76 cases of extra-peritoneal rupture reported by Maltrait, 47 proved fatal; in 96 cases of intra-peritoneal rupture, reported by the same author, only one recovered. Of the five cases seen by the writer, three died, one involving the intra-peritoneal walls and two involving the extra-peritoneal walls of the bladder.

A. M., male, 22 years of age, white, postal clerk, Oct. 9, 1896, Macon Hospital. One hour before admission fell thirty feet from a railroad bridge over a railroad track, striking rails below. Immediate shock and abdominal pain. Intense desire to urinate. Catheterization thirty minutes after accident showed empty bladder. Catheterization one hour and a half later showed a little blood and urine. Immediate laparotomy; extensive bloody extravasation of abdominal walls; pelvic peritoneum filled with blood and urine; extra- and intraperitoneal rupture of bladder; extensive fracture (with displacement) of pelvic bone extending into bladder cavity. Peritoneal drainage, extraperitoneal drainage, permanent catheter. Death from shock sixteen hours after accident.

T. A., male, 24 years of age, white, tramp, Feb. 19, 1898, Macon Hospital. Six hours before admission caught between cars, lower abdominal and hip regions involved. Intense desire to urinate, without passing urine. Pelvic and lower abdominal pain. Large supra-pubic mass, fluctuating on manipulation, to left of median line. Shock, nausea and vomiting. Catheter drew only blood from bladder. Supra-pubic incision opened large extravasation of blood and urine; wound of bladder (due to puncture of fractured pelvic brim) with the bone penetrating into bladder cavity. Suprapubic bladder drainage, permanent catheter through urethra. Death from general sepsis seven days later. Post-mortem, no involvement of peritoneal wall of bladder.

J. S., male, Negro, laborer, Feb. 8, 1908, out of town case. Seen eight hours after accident. Caught between cars, crushed pelvis, no external wound. History of intense and constant desire to urinate, small quantities of bloody urine passed; large supra-pubic mass fluctuating and dull upon percussion; catheterization small quantity of bloody urine. Immediate supra-pubic incision, escape of large quantity of thin, bloody extravasation smelling like urine. Extensive fracture and displacement of pelvic bones with perforation of bladder wall below pelvic brim. Suprapubic bladder drainage and permanent catheter. Death fifth day from general sepsis; abdominal walls gangrenous.

Mrs. J. C. W., female, 35 years of age, white, housewife, April 12, 1912, Macon Hospital. Thirty minutes before admission to Hospital, while seated in an automobile, was caught in a collision between the automobile and a street car. She was not thrown out of the seat of the automobile or otherwise disturbed, but immediately felt an acute pain in the prevesical region with signs of shock. No urinary symptoms. One hour later a suprapubic mass dull on percussion and fluctuating on palpation was discerned. Catherization showed bloody urine. Supra-pubic incision in one hour and a half after accident, a small rent in the bladder was found caught between the sharp edges of the fractured pubic arch. Bladder wound closed. Drain of prevesical space and permanent urethral catheter inserted. Complete and permanent recovery. Slight pelvic displacement of pelvic brim, which might be followed by some dystocia in a future confinement, the only result of the accident.

H. H., male, 24 years of age, Negro, railroad laborer, Aug. 20, 1912, Macon Hospital. Caught and rolled between a freight car and a brick wall, crushing the pelvis, no external wound. No severe shock, but frequent desire to urinate with no passage of urine. Ten hours after accident catheterization showed bloody urine. A large suprapubic mass dull on percussion present. Diagnosis, fracture of pelvis and laceration of bladder. Suprapubic incision, escape from abdominal wound of large quantity of blood and urine. Extensive fracture of transverse and descending rami of pubic bones found; replacement of broken bones impossible. Suprapubic drainage of bladder by drainage tube and permanent urethral catheter inserted. Recovery from accident. Later occlusion of calibre of membranous urethra from excessive bony callus requiring external urethrotomy and perineal drainage of bladder. Ultimate recovery.

INJURIES OF THE URETHRA

Wounds of the urethra, like injuries of the other viscera of the urinary tract, may be penetrating or subparietal; and may be caused by the same class of traumatisms. They may involve the pendulous urethra, the bulbo-membranous urethra, or the prostatic urethra. Gunshot and incised wounds are rare and punctured wounds are usually impaling injuries due to falls upon blunt pointed objects. Gunshot and incised wounds are usually confined to the pendulous portion of the organ; punctured wounds commonly involve the perineal urethra. Subparietal wounds

are generally confined to the perineal portion of the urethra and are due either to blows or kicks or falls astride a fence, a rail, or the pommel of a saddle. Subparietal wounds of the pendulous urethra may be caused by the organ being caught suddenly between two dull objects, as the falling of a window sash. Foreign bodies are sometimes found in the urethra.

The diagnosis of wounds of the pendulous urethra is comparatively easy and the treatment simple. For this reason they will not be further considered in this paper.

Subparietal laceration of the bulbomembranous urethra is rather uncommon and may give rise to serious results unless promptly recognized and carefully treated. Wounds of this class and location are generally due to falls or blows, which catch the tissues between the vulnerating body on the one side and the descending rami of the pubic bone on the other side. They are either incomplete or complete lacerations, that is, confined to injury of only a portion of the canal of the urethra or a division of the entire urethral wall. The writer has treated two cases of this class of injuries; one an incomplete laceration, and the other a complete laceration with retraction of the two ends of the injured urethral walls. Both were due to falls astride dull or blunt objects. The diagnosis is practically the same in both incomplete and complete cases, but the treatment is different.

The principal symptoms in these wounds are escape of blood from the meatus urinarius, difficulty in urination or retention of urine, obstruction to the passage of a catheter into the bladder, tumefaction in the course of the urethra, echymosis of the perineal tissues, and later abscess formation or gangrene of the surrounding parts. Blood escapes either slowly with an occasional discharge of a cylindrical clot, or it may be a continuous flow of blood from the meatus, depending upon the size of the ruptured vessel in the urethral walls. The hemorrhage of a complete laceration is of course more severe than that of an incomplete wound. The blood may clot and prevent the escape of urine through the urethra. The most urgent symptom, to the patient, is difficulty in passing urine or complete retention. These signs of the trouble are due usually to obstruction by blood clot or swelling around the urethra in incomplete wounds compressing the urethra, or destruction of the continuity of the urethral track in complete lacerations. Swelling and tumefaction rapidly follow the accident and are caused by the escape of blood and urine into the peri-urethral tissues. The swelling is always painful and is usually rapid in growth. Pus formation is a late symptom and is due to urinary infection; sloughing or gangrene will soon follow if not promptly relieved.

The mortality is high in severe injuries of the perineal urethra unless early relief is given the tissues. Sometimes the lacerated urethra is accompanied by fracture of the pelvic bone, a complication which materially affects the prognosis. Kauffman gives the mortality, even after early operation, as 14.15%; complicated with fracture of the bone he states the mortality as 40%. The cause of death is general sepsis. Traumatic stricture or urinary fistula may follow such injuries.

W. B., male, 19 years of age, Negro, laborer, April 14, 1898, Macon Hospital. Two hours before admission, while at work at a pottery company's plant, fell astride an upright pipe, the end of the pipe striking the perineum. Immediate profuse and continuous urethral hemorrhage. Shock and pain slight. Urine could not be voided and catheter could not be passed into bladder on admission to Hospital. Prompt perineal section performed and partial laceration of urethra found. Catheter passed through perineal wound into bladder and retained for one week. Complete recovery.

E. F. M., male, 52 years of age, Negro, railroad laborer, Nov. 16, 1911, while at work in the railroad yards unloading a car, had the skids to slip from under him and in falling the skids struck him in the perineum. When first seen, there was profuse bleeding from the urethra, some passage of urine at frequent intervals. He declined to go to the hospital for operation and expressed a preference for his own physician to treat him. One month later he requested that the company's physician should take charge of his case. Bloody discharges from the penis had stopped, and only a few drops of urine could be passed every few minutes. A catheter or sound could not be passed into the bladder. Upon operating, a sound was passed into the urethra to the point of obstruction, a large solid mass occluding the further passage of the sound. A perineal incision was made and the urethra dissected out; the sound and the mass being the landmarks for the operation. The proximal urethra was found in the mass of cica-

trical tissue and all of the surrounding mass cut away. The proximal and distal ends of the urethra were brought together with buried catgut sutures over a permanent rubber catheter passed through the two ends of the urethra and into the bladder and the urethral channel restored. Recovery finally took place after months of frequent passage of the sound to keep the stricture from completely closing. Complete recovery.

DIAGNOSIS

The early recognition of injuries of the urinary tract is exceedingly necessary in order to meet and successfully treat these grave accidents. In all contusions, blows, rolling or crushing accidents involving the loins or back, the lower part of the abdomen, pelvis or buttocks, and the perineum, careful examination of the urinary functions should be made to ascertain the presence of blood. In these cases the catheter should be used early and freely; it is the rule of the writer to pass the catheter promptly on the admission of all patients injured in these localities. Careful regional examinations should also be made for the presence of physical signs or subjective symptoms of such injuries. In gunshot wounds of the abdomen, no matter where the point of entrance may be, upon opening the abdomen, careful intra-abdominal examination of the kidney and bladder regions should be made for possible perforations of the viscera.

The points to be remembered in differential diagnosis, are:

Wounds of the Kidney.—History of injury to loin, back, or upper abdomen. Patient able to urinate. Catheterization easily accomplished. Blood in the urine with ureteral casts. Cystoscopy to differentiate right or left ureteral hemorrhage. Renal colic and referred pain. Tumefaction in region of kidney involved.

Wounds of the Bladder.—History of suprapubic or pelvic injury. Constant desire to urinate with tenesmus. Catheterization yields "dry tap" or small quantity of bloody urine. Suprapubic pain and tenderness. Suprapubic tumefaction and bogginess.

Wounds of the Perineal Urethra.—History of perineal injury. Constant escape or slow oozing of blood from meatus. Possible retention of urine. Obstruction to passage of catheter. Perineal tumefaction and ecchymosis.

TREATMENT

The lines of treatment for these injuries should be:

Kidney Wounds.—In mild cases, rest and ice bags locally; conservative watching. In grave cases, with excessive shock and signs of intra-peritoneal hemorrhage or rapidly growing tumefaction in loins, incision and suture of kidney wound with drainage, or nephrectomy. If infection is present, incision and drainage, or nephrectomy. In all cases employ urinary antiseptics.

Bladder Wounds.—Open up and explore suprapubically; in extra-peritoneal laceration close vesical wound and employ prevesical drain if possible; if not, use suprapubic vesical drain. In intra-peritoneal laceration close bladder wound and use peritoneal drainage. In all cases use retention catheter through urethra. In all cases employ urinary antiseptics.

Deep Urethral Wounds.—Perineal incision, catheter passed and retained in the bladder, as in external urethrotomy, if incomplete or partial laceration. If complete laceration, perineal incision, find ends of divided urethra, suture ends of torn urethra over permanent catheter passed into the bladder through urethral canal, close perineal wound with superficial drain. In infection and perineal abscess or localized gangrene, free incision and multiple drains. In all cases employ urinary antiseptics.

THE PROPER MANAGEMENT OF PLACENTA PREVIA.*

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Definition.—Placenta previa is the development of the placenta in part or wholly within the zone of dilatation of the uterus.

Diagnosis.—There is generally found considerable hemorrhage, with a one-or-two-finger dilatation. Diagnosis before dilatation is difficult and unreliable. 65% give symptoms before completion of term. When painless, idiopathic hemorrhage oc-

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curs, the diagnosis should be confirmed, or the case should be treated as placenta previa.

Gloves.—Rubber gloves should be worn in all obstetrical maneuvers.

Maternity.—Every placenta previa should be sent to a maternity hospital upon diagnosis. If there is no maternity hospital at hand, prompt measures should be instituted for home treatment, and a staff of nurses and physicians kept on duty until the case is disposed of.

Management.—In determining the management of placenta previa the things to be considered are the surroundings, condition of mother and child, duration of pregnancy, degree of previa, progress of dilatation, skill of accoucheur, and whether the woman is in labor.

Immediate induction of labor should follow the diagnosis, unless the child is approaching viability, the bleeding is slight, and the patient can enter a well equipped maternity institution. When labor has begun the dominant thought and effort should be to save blood, empty the uterus and combat anemia.

While waiting for proper cervical dilatation before proceeding with delivery, normal salt solution may be given and every detail of subsequent emergencies carefully anticipated. Do not give pituitrin, and do not hurry extraction through a poorly dilated cervix. In placenta previa fatal hemorrhage may arise from a tiny cervical tear.

In marginal placenta previa the hemorrhage usually begins toward the end of the second stage of labor, and puncturing the membranes allows the placenta to recede with the lower uterine segment, the presenting part also compresses the placenta and bleeding is stopped.

When the child is delivered immediate attention should be given to the removal of the placenta. After placental extraction watch competently for bleeding, and, if it occurs, utero-vaginal packing should be done. All cervical tears should be repaired.

Tampons.—Cervical and vaginal packing with gauze may be done for hemorrhage and dilatation.

Winn[2] thinks the cervical and vaginal tampon is a dangerous makeshift and one demanding rigid technique.

Reinhardt[3] does not use the tampon, and questions its wisdom. If used, it should be through a speculum and with careful asepsis. A moist tampon controls hemorrhage better than a dry one.

Edgar[4] reports forty cases from the Manhattan Maternity. The routine there was controlling hemorrhage and securing cervical dilatation by cervical and vaginal gauze packing.

Newell[5] packs the uterus in post-partum hemorrhage with gauze wet with alcohol, and, upon its removal, irrigates with 50% alcohol. A solution of alum may be used instead.

In placenta previa of primiparae or others, where the cervical dilatation will only admit one finger, both the vaginal tampon and colpeurynter are quite questionable. Where the head is not engaged in the pelvis there will not be sufficient counter pressure, and either of these methods will merely convert an external into an internal hemorrhage. Here Cesarean section may be the safest procedure.

Version.—Nagel[6] performs bipolar version at once, extracts and loops a foot, leaving the case to natural expulsion.

Davis[7] thinks combined version, foot delivery, and spontaneous expulsion the safest procedure in private homes.

Fry[8] emphasizes the wisdom of bipolar version and slow delivery, urging the unwisdom of fast dilatation and hurried extraction.

C. H. Stratz,[9] who has treated 173 cases with the loss of only one mother and this by embolism, unconditionally advises Braxton-Hicks version in placenta previa. While the maternal mortality with this method is much lower, the infant mortality is considerably higher. He would never use the tampon and thinks metreurysis unnecessary when the Braxton-Hicks procedure is correctly carried out. In his opinion, initiatory tamponing and hurried extraction should never be done.

DeLee[10] thinks, unless the woman's condition is fair, the child viable, the instrumentarium ample, and the operator experienced, Braxton-Hicks version is the thing to do. He brings down one foot and makes sufficient traction to make the thigh compress the placenta against the cervix to control the bleeding. Then he rests his case. He does not hurry the labor, and

only makes traction to control hemorrhage until the cervix is sufficiently dilated. If there has been much bleeding normal salt solution is given subcutaneously as soon as version is performed.

Combined version is the most available and successful treatment for the mother, but the fetal mortality is very high. If forced delivery follows version, there is frequent cervical laceration and resultant hemorrhage.

Bag.—The use of the bag gives a somewhat better chance to the child, but the increased manipulation is bad for the mother. The bag should not remain longer than six hours, on account of infection. Blood loss from its use has been found to be double that of combined version.

Cragin[11] reports forty-nine cases at Sloan Maternity Hospital. The routine treatment was dilatation of the cervix and control of hemorrhage with the bag. When sufficient cervical dilatation was secured version was performed, with breech delivery, or, in suitable cases, the vertex was allowed to compress the placenta and delivery occasionally hastened with forceps.

After viability, J. F. Winn[12] advises the intra-ovular elastic rubber bag and internal podalic version. The bag unavailable, Braxton-Hicks version should be done. In any form of placenta previa during labor with hemorrhage, Braxton-Hicks version offers best maternal results. This procedure should be followed by slow extraction. In marginal and lateral cases, puncturing the membrane will usually control the hemorrhage.

An improper use of the bag will allow large concealed hemorrhage. Rapid dilatation of the cervix and rapid delivery of the uterus are to be avoided. Infrequently the baby may be saved by this procedure, but the maternal mortality and morbidity are much increased.

After dilatation hemorrage is controlled by the presenting part. After delivery immediate attention is given to the third stage. If there is much bleeding the uterus must be emptied manually, and, if it continues, packing is done.

Where the surroundings are favorable, the operator skilled, the condition of the mother and child good, metreurysis is the procedure of selection. Every detail of the technique should be carefully anticipated. There are a number of satisfactory colpeurynters obtainable. The original Carl Braun is all right. After sterilization, the bag is put in a basin containing the solution of choice, emptied of air, and grasped with uterine dressing forceps. The membranes are punctured, the bag guided with the fingers, and placed on top of the placenta, being careful not to push up the edges of the placenta, as it might double under the bag, and allow intra-uterine bleeding. Remove the clamp from the bag, steady colpeurynter, and inject four to twenty ounces into the bag. Put a clamp on the tube and only make traction enough to control bleeding. One or two pounds are enough, and this may be regulated by putting a pair of baby scales on and weighing to this extent. The pressure should be withdrawn about every five minutes to relieve the surgical anemia, and minimize the risk of subsequent laceration. Relax the pull during the pains, and do not leave the patient while the colpeurynther is in position. Note progress accurately enough to be able to determine when the bag is expelled from the cervix, otherwise a serious amount of blood will balloon above it.

When the bag is expelled the presenting part of the child should immediately engage the placenta against the cervix. If the head is high it may be forced down and delivered with forceps.

Failing to engage the head properly, podalic version may be performed, and the placenta compressed with the thigh of the child.

Should dilatation be insufficient when the bag is expelled, it may be reintroduced and a larger quantity of fluid injected into it. Twenty-four ounces will approximate the fetal head.

Cesarean Section.—Davis[14] considers placenta previa a variety of ectopic gestation and justifies abdominal section on the same grounds as tubal and other varieties of pelvic and abdominal extra-uterine pregnancy.

In abdominal section "uterine apoplexy" should be borne in mind, and when the uterine muscle shows this condition of blood infiltration, it is probably safest to do a hysterectomy.

Cesarean section is a hospital proposition limited to certain well selected cases.

When the cervix is undilated, the child living, the bleeding threatening, pains absent, and aseptic precautions can be instituted, Cesarean section is the operation of choice[15].

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THE APPLICATION OF PROTRACTED PROCTOCLYSIS IN THE TREATMENT OF ECLAMPSIA*

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Proctoclysis, as defined, is drenching the rectum. Protracted proctoclysis is a more or less continuous rectal drenching, the inflow and the outflow of the irrigating fluid being conducted by means of a suitable and selected rectal tube.

The history of proctoclysis is too well known to dwell upon.

By far the most satisfactory tube that I have employed is the one called "Kemp's rectal irrigator," or more familiarly known in general hospitals as "Kemp's return tube." This tube is no doubt more or less familiar to you. It is due to the ingenuity of Dr. Robert Coleman Kemp, of New York City, that we have such a practical instrument for rectal irrigation. The tubes are made of hard rubber or metal, and in several different sizes, but conforming to one general pattern. The bore of the inflow is slightly less than that of the outflow. Such a tube can be readily procured from one of our well equipped instrument makers. The use of this tube is in no wise intended to conflict with the classical obstetrical or medical measures in the treatment of eclampsia; its use is simply a determined effort to secure elimination more promptly and more thoroughly.

Antepartum and parturient types of eclampsia should be converted into the postpartum type by Caesarean section, forceps, or other appropriate and advantageous obstetrical procedure; for, of course, with the prompt removal of the product of conception we advance our curative treatment.

PREPARATION

If the patient is conscious, administer from 60 to 90 cc. of castor oil; or if unconscious, or in coma, give oil of croton, one to three drops, in some bland oily medium. It may be necessary to introduce it into the stomach by means of the tube. As a rule, it is a good plan to give castor oil with a free hand throughout the condition and in convalescence as well.

Preceding or following the preparatory catharsis, it would be well to flush the rectum and as much of the lower intestinal tract as can be reached by "high s. s. and g." or saline enemata. This should be persisted in until a clear return flow is secured. The flushing by enemata removes the less fluid intestinal contents, fecal particles, and heavy slugs of mucus which otherwise would interfere with a free return flow, when the continuous proctoclysis is instituted.

TECHNIQUE

Elevate the foot of the bed to the height of two to three bricks (approximately 5 to 8 inches). It will be found of advantage to have the patient naked in the bed, as she is continuously in hot wet blanket packs; for when diaphoresis is working to the limit, frequent and vigorous toweling is necessary. Therefore, this should be made as convenient as practicable. Diaphoresis will be found almost as essential as diuresis for elimination. As a rule, though, the action of diaphoresis in eclampsia lags behind diuresis.

The most advantageous positions are left lateral prone (Sim's), right lateral prone, and the supine or dorsal. In the dorsal position the thighs may be flexed or extended. The position of the patient should be changed every four or five hours to avoid hypostatic congestion and per-

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haps a supervening pneumonia. The tube should be generously coated with some non-absorbable lubricant, as heavy vaseline, and inserted into the rectum as far as the flange or shoulder will permit.

Anointing the tube, in a measure, prevents or limits maceration and soreness of the rectum and the anal margins, caused by the tubal pressure in the presence of so much moisture. Maceration higher up in the rectum, independent of pressure, may be caused by the too protracted reservoiring of the irrigation fluid in the rectum and the lower intestinal tract. Maceration impairs, to a certain extent, the special property of the intestinal mucosa described by physiologists as "imbibition." As a rule, though, I continue the irrigation without interruption for from twenty-four to seventy-two hours, and occasionally, if indicated, allow rest periods. The rest periods have the effect of limiting maceration.

Introduction of the tube from five to six inches into the rectum with a moderate degree of elevation of the pelvis or hips will give sufficient fall to the fluid reservoired in the rectum to insure a high irrigation. A pad of cotton batting should be placed about the protruding portion of the tube to protect the vulva and the soft parts from contact with the tube and attachments. A reservoir of generous capacity elevated to the height of two to three feet above the level of the rectum is to be used as the irrigation reservoir.

To the delivery end of the "Kemp tube" should be connected a piece of tubing of sufficient length to conduct the irrigating fluid from the rectal reservoir to a tub or suitable receptacle at the bedside. The distal end of the delivery tubing is to be kept slightly above the surface of the fluid in the drainage receptacle, so that the irrigating fluid in draining away from the rectum will make a sound in falling when the flow outward is continuous and uninterrupted.

Cessation of the sound will serve as a warning that the outflow has ceased or has become diminished and that the rectum may be becoming unduly and undesirably distended, due to the partial or complete obstruction in the outlet tube or tubing. Do not become discouraged on account of the stoppage of the efflux, which at first may be more or less frequent. After the flow is once well established, trouble of this character is infrequent. The contents of the upper portions of the intestinal tract, as they come down, are fluidified or made pultaceous in the rectal bath and pass away in the continuous stream. This does not necessitate the removal of the tube for periodic fecal evacuations, and at the same time limits resorption that would occur if the rectal contents were evacuated only periodically.

The bore of the outflow is one to two millimeters greater in diameter than that of the inflow. Therefore, it affords opportunity for the more rapid drainage away from the rectum and the lower intestinal tract than the fluid is introduced, and permits only a limited accumulation of the irrigating fluid in the rectum,—an accumulation due mainly to the horizontal position of the patient with elevation of the pelvis or hips. The intestinal absorption from the constantly freshened fluid in the rectal reservoir is by osmosis and imbibition. Imbibition is, of course, a selective property of the intestinal mucosa, the specific action of which practically nothing is known.

After death or extensive damage to such a membrane, imbibition would play no part in the passage of solutions, as only living tissues possesses this property.

TEMPERATURE OF THE IRRIGATING FLUID

The temperature of the irrigating fluid should be maintained at from 105 to 120° F. Any desired degree of heat within this range may be maintained according to the indication and desire for heat stimulation in the individual case. The most satisfactory thermometer to use in tempering the fluid is that used by tanners and made to withstand great heat.

NATURE OF THE IRRIGATING FLUID

Kemp has shown by careful and painstaking experiments that acute renal congestion can be diminished by using rectal injections or irrigations of normal saline or decinormal saline, and that diuresis may be caused as promptly as within from twenty to thirty minutes. And he has employed a very simple and practical test to determine this.

TEST

Irrigating fluid, in the proportion of 5 cc. of a 5% potassium ferrocyanid solution to one liter of normal or decinormal saline solution, is introduced into the rectum by appropriate means, and every minute the urine is tested against ferric chlorid for a Prussian blue reaction. Kemp has also shown that specific kidney action can be obtained by enteroclysis, or injections into the rectum, using normal saline, without raising the blood pressure.

In the earlier course of the irrigation, employ the normal or the decinormal saline solution, and continue it until catheterization or voluntary voiding demonstrates the fact that the secretion of the urine is progressively increasing in volume and improving in quality.

With the establishment of moderately good urinary function, tap water at the temperature above mentioned will, in my opinion, serve about as satisfactorily as the normal or decinormal saline. In fact, I would prefer not to have saline absorption continued beyond a period sufficient to establish a moderately good rate of secretion or improvement in quality. Should there be edema of the lungs, especially would I select plain tap water, and at the temperature specified. And I would be guarded in pushing the irrigation with such a condition existing.

A close watch is to be kept on the vesical output as to the volume and the quality. At first catheterize the patient at more or less frequent intervals. Later, catheterize every six, eight or ten hours,—if not voiding voluntarily,—or as frequently as desired. If any tendency to suppression is shown by marked diminution in output, I would at once return to the normal or decinormal saline solution. Otherwise, I would continue the irrigation with plain tap water at the selected temperature.

RATE OF THE FLOW

In the earlier stage of the irrigation in order to maintain a rectum as clear as practicable of fecal particles,—which may be brought down by the persistent action of the preparatory catharsis or peristaltic action,—the current of the fluid inward and outward may be maintained at full force for as long a period as may be considered desirable, or as long as may be required to obtain a relatively clear return flow. Allowing this current to run full force, with the irrigation reservoir at an elevation of from two to three feet above the level of the fluid in the rectum, from seventy-two to eighty litres (roughly 18 to 20 gallons) of the fluid could be passed through the rectal reservoir in an hour, or from 1,600 to 2,000 litres (approximately 400 to 500 gallons) within a twenty-four hour period. Later in the irrigation stage the bore of the inlet tubing may be reduced by some clamping device so that the flow is not more rapid than from three to five drops per second; but neither rate causes an undesirable degree of rectal distention, as the outflow bore is always larger than the inflow.

Of course, with such favorable signs as restoration or improvement of vision, return of consciousness and intelligence, loss of lividity, markedly lowered blood pressure, marked increase in the volume and improvement in the quality of the urine, disappearance of the headache, a skin that remains moist with moderate blanketing, etc., we would be less persistent in this measure, lengthening the rectal rest intervals and shortening the irrigation periods,—but discontinuing it only when deemed advisable. With the return of consciousness, the patient should be encouraged to drink from 400 to 500 c.c. of water every two hours. In some cases it may be advisable to introduce the water at an elevated temperature into the stomach of an unconscious patient by means of the tube.

The coefficient of absorption can always be ascertained with a relative degree of accuracy by measuring the amount of the inflow and that of the outflow and making proper deduction. In this connection it would be well to state that venesection is to be employed at such times as it may be indicated. In the last fifteen or sixteen years the physiologists have given us nothing new on the subject of absorption of water by the gastro-intestinal tract.

I believe that you will find this method simple and practicable. By means of it I have secured some very satisfactory and gratifying results; therefore, I feel that I may commend it to you for trial.

Atlanta National Bank Building.

EYE, EAR, NOSE AND THROAT

A REVIEW OF THE ETIOLOGY AND PATHOLOGY OF TRACHOMA.—DIFFERENTIATION FROM ALLIED CONJUNCTIVAL CONDITIONS.*

By J. Morrison Ray, M.D., F.A.C.S.,
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As an introduction to what I have to say in this paper, I want to impress upon you the statement that such expressions as "granulated lids" and "granular conjunctivitis" are of no scientific value. These terms have been used to cloud diagnoses, as they may signify any form of conjunctival or lid disease to which the membranes of the eye are subjected. They convey no idea of a definite pathologic entity to the ophthalmologist. While the term trachoma means a roughened appearance of the conjunctiva, today we understand by it a specific contagious form of conjunctivitis, extremely chronic in character, lasting months and years, and when left untreated causing serious and often permanent impairment of vision,—not infrequently total blindness.

Our present knowledge of trachoma began with the epidemic of what was called at the time "Egyptian Ophthalmia," which invaded Europe in the early years of the past century. Soldiers returning from the Egyptian campaign brought the disease with them and spread it broadcast. Fukala has shown that it actually existed in epidemic form among the population of ancient Greece and Rome and that Cicero (B. C. 106) suffered from the disease in a severe form. At the present time there seems to be no part of the world exempt from the disease. However, it has been shown that certain races and certain geographical conditions offer a certain amount of immunity. Our ideas of its etiology and pathology first took concrete form from the work of Saemisch, who in 1876 from an etiologic and pathologic study demonstrated a distinct difference between trachoma, folliculosis and similar conditions. These researches commencing more than thirty years ago have been prosecuted with zeal and energy; yet today there exists uncertainty on some points. Notwithstanding the many confusing and contradictory observations that have been made, the contagiousness of trachoma stands today clear and undoubted.

The nature of the infectious agent is the problem which unfortunately has never been solved.

The first published observations on the microbial origin of trachoma were those of Hirschberg and Krause in 1881. These investigators announced that they had discovered a club-shaped organism in the secretion obtained during the acute stage of trachoma, but had failed in the chronic stage. At the present time it is well understood that acute trachoma is due to an added infection and that uncomplicated trachoma is always of a chronic character. In Egypt, where the disease commences often in infancy and early childhood, it occurs as an acute inflammation of the conjunctiva, largely purulent in character. Therefore the observations of Koch in that country in 1883, in which he found in the disease both the gonococcus and an organism now known as the Koch-Weeks bacillus, as well as many others, led to the statement that it was an associated venereal infection. Other observers having found the gonococcus in the Egyptian epidemics, and, as in that country children as young as two years contract the disease, its venereal origin was affirmed.

McCallan, while verifying this finding, is of the opinion that it is a coincident, and only because of the excessive prevalence of trachoma did they often find the added gonococcal infection.

Following these observations of Koch, Sattler and Michel—working separately—thought they had found a coccus that was the causal agent, but their researches have not been confirmed. Muller in an extensive observation found the gonococcus,

*Read before Jefferson County Medical Society, Louisville, Ky.

Koch-Weeks bacillus, the Morax-Axenfeld bacillus, the pneumococcus and other cocci. In addition an organism which he designated the trachoma bacillus Arnold Knapp and others trying to verify Muller's experiments, came to the conclusion that this organism was similar to the influenza bacillus.

Next, Noisewski brought forward a new specific agent. He denied the specific nature of the organisms of Hirschberg, Sattler, Michel and others, but said his discovery of a bacterium which he named "microsporon trachomatosam" was the infecting agent in true trachoma, and that he was able to reproduce the disease by inoculating with this organism. No one has verified these findings.

In 1894 Fuchs, after a long series of observations, came to the conclusion that the ultimate origin of the disease was gonorrhea, or, in other words, that it was an attenuated gonorrheal infection, agreeing largely with the observation which I quoted as having been made by Koch in Egypt.

In 1909, Halberstaedtler and Von Prowazek, working on trachoma in Java, isolated, by using the Giemsa stain, fine red stained granules which coalesced and formed bodies which covered the nucleus of the cell like a cap. Prowazek considered these parasitic, called them chlamydozoa, and claimed to have reproduced trachoma in the ourang-outang by inoculation with this parasite. Soon afterward Greef verified these findings. Since that time a vast amount of literature has accumulated dealing with this organism and its significance in the diagnosis of trachoma. Its value as the specific organism has been lessened by the fact that it has been found in non-gonorrheal blenorrhea in children and in the genital tract of both men and women.

Yet the work of Noguchi and Cohen seems to prove it a factor in certain cases. For instance, they found it in 60% of the cases of typical trachoma. They did not find it a single time in folliculosis of the non-inflammatory type, and in 250 cases of folliculosis with secretion, the so-called follicular conjunctivitis, they found it nine times. Of these nine cases Cohen, who followed their course, says: "They were so-called border-line cases, cases in which clinical differentiation seemed impossible. Yet after two and one-half years not one of these presented any of the pathologic changes seen in trachoma, such as pannus and scar tissue." He remarks that if trachoma can exist in such a mild form that its evolution to complete cure takes place without cicatrization, pannus or other sequellae, then our description of trachoma as considered by most ophthalmologists must be somewhat altered.

The strongest laboratory evidence that the Prowazek bodies are not the specific organism in trachoma is the statement of McCallan that if the material containing these bodies be passed through a Berkfeld filter the bodies are no longer detected, yet the filtrate will still be found to be infectious. These organisms have been found not only in the follicle but in the deeper parts of the subepithelial tissue. Investigators have been able to inoculate only man and the higher species of monkey with the trachoma virus. In this respect they agree with experiments made with the gonococcus.

The conjunctiva or mucous membrane of the eye starts at the free edge of the lid where it is continuous with the skin. It lines the underside of the tarsus of each lid, being firmly attached to the fibrous covering of these eliptical plates. At the attached edge of the plates it becomes thrown into folds known as the cul-de-sac or retro-tarsal folds, thence it is reflected on to the sclera, being held to the latter by loose connective tissue. At the sclero-corneal margin it becomes firmly united and is continued on to the cornea, only as the epithelial layer of this tunic. Like all mucous membranes it is made up histologically of an epithelial layer, a basement membrane, and a loose reticulum of connective tissue known as the sub-epithelial tissue or substantia propria. Scattered throughout this membrane are found a number of mucous glands for the purpose of moistening the surface. The substantia propria consists largely of adenoid connective tissue, in the meshes of which are found numerous lymphocytes, especially in the more superficial layers. These lymphocytes are scarce in the new-born infant, but, as was shown by Bendz, as age advances they increase in number and eventually form aggregations of lymphoid

cells which, because of their similarity to the solitary follicles of the intestine, he called lymph follicles. They consist of lymphatic gland tissue, surrounded by a very thin capsule. They are found most abundantly in the retro-tarsal folds, next on the caruncle and semi-lunar fold, sparsely, and isolated one from the other on the tarsus, and never noticeable on the bulbar conjunctiva except in conjunctival inflammation. In many healthy eyes where these follicles are not easily discovered, any condition that will produce conjunctival irritation or hyperemia will cause them to show up more prominently and often in great numbers.

It has been universally acknowledged by physiologists who have investigated this membrane that as a result of bad hygiene and local irritations or inflammations and in certain systemic conditions, there is an increased development of this lymphoid tissue. Like those in the mucous membrane of the respiratory and alimentary tracts, they act as sentinels or protectors reacting to attacks of injurious agents of various kinds. Therefore, according to Ridley, Harman, Parsons and others, the so-called trachoma granule is the lymph follicle, modified by the action of the trachoma organism.

Mayou says the follicle, when infected by trachoma, undergoes a distinct change from that found in follicular formations. As a result of the organism or its toxin a chronic infiltration takes place not only in the follicle but in the surrounding tissue. This infiltration, unlike that found in other forms of chronic conjunctivitis, is not limited to the layer lying directly beneath the epithelium, but spreads to the very deepest layer of the conjunctiva and even beyond, attacking the fibrous covering of the tarsal plates.

Harman thinks the great tendency to excessive growth of stroma filled with large endothelial cells is a diagnostic point of great value. He says these changes stand out prominently and differ markedly from the changes found in any other affection of the conjunctiva.

Parsons says the changes brought about in the follicles as a result of trachoma infection differs from what takes place in other conjunctival infections. The cell infiltration is greater, the cells are larger, a definite reticulum is formed, and numerous capillaries develop. The capsule becomes thinner and often will be found ruptured. The epithelium is much thicker than in other chronic conjunctival conditions and the follicles instead of standing out from the surface with the epithelium dipping down between them as in folliculosis, will be found pushed up from a bed of infiltrated tissue and the epithelium on its summit will frequently be absent, leaving erosions or ulcerations. As a result of these changes when the later stages of the diseases are reached the sub-epithelial lymphoid tissue becomes replaced by fibrous tissue; and according to the law of all such tissue contracts and the white lines known as "Arlt's streaks" appear, characterizing the final or cicatricial stage. This destruction of the follicle by the trachoma organism or its toxin has its analogue in the gut, due to the action of the typhoid organism upon Peyer's patches. The inflammation causes a deposit of new connective tissue which in the healing process contracts, often narrows the gut, or leaves scar tissue.

In regard to the changes found in the condition named by Saemisch folliculosis, Parsons says: "Since it is true that these follicles and the early stage trachoma follicle are essentially identical, little can be said of them histologically. Yet the subsequent changes are very different. These follicles are normally present in school children; they are often associated with adenoid vegetation in the throat; they are excited by bad air, and by chemical and bacterial irritants. They are familiar in irritation from atropin, eserin and sometimes from astringents." The fact that they disappear without treatment and without leaving any pathologic change in the conjunctiva, proves fatal to the theory that they are the first stage of trachoma development.

There is one other conjunctival condition that in some respects suggests trachoma. That is what is called Spring catarrh or vernal conjunctivitis, a disease usually found in the early Spring as soon as warm weather begins. It presents among its other symptoms frequently on the upper lid a mass of tissue slightly suggestive of trachoma, but the burning sensation, or itching, its peculiar pale color, and the

fact that it subsides with cool weather in the Fall and entirely disappears, locally, to return with warm weather, excludes trachoma; and furthermore, it gets well without leaving a vestige of change in the conjunctival membrane.

I have thus tersely reviewed the work that has been done in regard to the etiologic factor in trachoma, and while we must admit that the specific organism has not been isolated, the efforts have not been entirely in vain. They go far to prove that trachoma is a distinct entity and that etiologic conditions are found in trachoma that do not exist in any other conjunctival disease.

Next, the histologist and pathologist assert that while there are no radical differences in the changes in the follicle found in the inception of trachoma and folliculosis, due to the fact that the lymph follicle is the same in both, the later changes are characteristic and distinct.

The clinical course followed by trachoma can be explained by the pathologic picture present in the infected follicle. In other words, the follicle and the changes taking place in them originate both the histological and clinical features of the disease.

No disease produces the great amount of thickening in the deep layers of the conjunctiva or the infiltration in the fibrous tissue making up the tarsal plates. No other disease so early and so consistently attacks the cornea in so characteristic a manner.

Clinically, a careful study of the local appearance will in a very short time enable the properly trained observer to make a differentiation. He should bear in mind the fact that in folliculosis the enlargements stand out more prominently from the conjunctiva, that they are more superficially placed, that the surrounding conjunctiva is not infiltrated or thickened, and that the lids are soft and pliable and do not droop.

Many facts are involved in a clinical study of trachoma that throw much light upon its etiology and pathology. For instance, we very rarely see the disease in childhood except in families where adult members are suffering from the same condition, or in institutions where the disease has at one time been overlooked or neglected.

Folliculosis may last a long time in children without causing discomfort or annoyance. Trachoma gives rise to discomfort very early in its inception. Eversbach, in his work on "Eye Disease in Children," says that after trachoma infection in children within one year pannus is almost sure to develop.

It has been shown that certain local conditions in the conjunctiva must obtain before infection will be brought about. In other words, many seem for a long time immune. I can recall the case of a physician who married a young woman suffering from trachoma. They lived together for fifteen years before he contracted the disease. During this time she suffered many acute infections with much secretion. They used the same wash basin, same linen and oftentimes the same handkerchief or other articles liable to carry the infection. Whatever may be the shortcomings of the modern text-books on ophthalmology, in their description of the clinical appearances of trachoma and follicular conditions they are practically unanimous in the assertion that the two conditions are distinct. Boldt says that "there are many upholders of the unitarian theory of these diseases among military surgeons, health examiners and school inspectors who have had no experience in treating trachoma, while the great majority of ophthalmologists maintain the dual nature of the conditions."

Since the systematic inspection at the port of entry of immigrants has become a law, and more recently the medical inspection of school children has been undertaken, added interest in the proper diagnosis of trachoma has come to the front. If it were true that follicular disease and trachoma were identical, that is, that the latter was a later stage of the former, it seems hardly possible that among the number of cases of follicular disease that for many years have been under my observation in clinic, in private practice and in eelemosynary institutions where they were watched and often no treatment was carried out, but that trachoma and its sequellæ would be found. On the other hand, I have never seen a case in which the diagnosis of folliculosis was made later

evolve into trachoma. Axenfeld maintains that if close clinical observation amounts to anything, it must refute the statement that any chronic conjunctival irritation may relapse into trachoma.

Atherton Building.

TREATMENT OF TRACHOMA*

By Horace T. Aynesworth,
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Among eye afflictions trachoma ranks high both as to the number of its victims and its seriousness. The victims of trachoma, with the rough lids, poor sight, altered and deformed appearance, painful and congested eyes, inturned eye lashes, etc., are indeed to be pitied. As all know, one of the chief difficulties encountered in the proper management of this condition lies in the fact that its onset is often so insidious that serious damage has frequently resulted before the patient is induced to consult a competent oculist.

Trachoma is a very old disease and is found among all peoples, though more in some than others. The United States has taken strict measures to prevent foreigners so affiicted from landing on its shores, but doubtless many succeed in one or another way in eluding the vigilance of the Government. Within our own population the Indians are especially liable to trachoma. Among 39,231 examined, 22.7% were found affected. The percentage was highest in Oklahoma, 68.7%, and lowest in New York, 0.2%. In Oklahoma, 25% of the white school children are reported to have trachoma, owing in part at least to its wide prevalence amongst the Indians. In the mountains of Eastern Kentucky, in a district composed of seven counties, at least 12.5% of the population are estimated by Stucky to be so afflicted. Quite a large number in our own state of Texas have it, but the exact number or percentage is not known. On the other hand, some sections of the United States seem to be practically free of trachoma; so much so that cases are rarely seen even in a large practice. The Negro seems to be practically immune. I do not recall having seen a case in the Negro race. It should be a comparatively easy matter to get the exact percentage of school children suffering from trachoma, since systematic inspection by supposedly qualified men has come so largely into vogue in all of our cities. In speaking of the prevalence of trachoma, the writer considers this the proper place to discuss briefly the confusion that seems to exist between the diagnosis of trachoma on the one hand and several other diseases, especially follicular conjunctivitis and vernal conjunctivitis, or Spring catarrh, on the other.

With reference to follicular conjunctivitis, it is the writer's opinion that many, if not most, of the cases diagnosed as trachoma in school children are not trachoma at all, but follicular conjunctivitis. If this be true, the number of school children suffering from genuine trachoma is small as compared to the number usually given. In adults the two diseases are doubtless rarely confused. A conjunctival trouble that gets well under simple measures, including expression, should not be called trachoma. The latter is not so easily handled. The writer has seen several cases of vernal conjunctivitis, so diagnosed by him, that have been called trachoma by others, and he is inclined to think that this mistake is more frequently made than is usually supposed. As to the diagnosis "granulated lids" that so many carry around with them, which is nothing more than eyestrain, irritation from occupation, exposure, etc., no one belonging to this Association should ever be guilty of making it, or if he has been so guilty in the past he should at once ask forgiveness from the patients he has so wronged and deceived.

The early recognition and proper treatment of trachoma can not be too strongly stressed, since probably 75% of untreated or improperly treated cases will lead to damaged eyesight, while many other cases are so malignant from the beginning that even under any but the most radical treatment they will go on to greatly impaired vision or perhaps to practical blindness.

Writers divide trachoma into the granular and the papillary forms. These are

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again subsidivided into the acute, subacute and chronic. The types are often mixed and the stages pass insensibly from one into the other. Outside infection is the rule. In a general way the granular form more nearly approaches the benignness of follicular conjunctivitis, and is more amenable to simple measures, such as astringent lotions, improved hygiene and health, expression, glasses, etc. The papillary form is by far the more severe and causes most of the serious complications of trachoma such as trichiasis, entropion and other lid changes, pannus, corneal ulcers and loss of sight. It is the truly malignant kind so far as the sight is concerned. The acute stage is probably in most, if not all, cases complicated with other infection to produce the free discharge, etc. This is probably best treated by silver nitrate, 1 to 2%, applied to the everted lids once a day, with argyrol and other measures with which all are familiar. Atropin, dionin and hot applications are added if corneal ulcers, iritis or pannus supervene. The above treatment is continued till the acute stage is passed and the free discharge stopped. The writer does not believe in operating in the presence of much discharge and severe complications when the above line of treatment is effective, and in his experience it is practically always so. To do the radical Kuhnt-Heisrath operation during the acute stage will generally aggravate any existing iritis or corneal ulcer, especially the latter.

In the subacute stage, if one is to continue to rely upon medical measures, the treatment remains much the same, depending upon the nature of the complications present. Here one changes gradually or not, to the time-proven copper sulphate stick or one of its substitutes. This is applied daily or every other day, any existing complications appropriately treated, and some eye lotion, preferably containing zinc sulphate, ordered for home use.

In the chronic stage the copper or its substitute is continued till both patient and doctor are tired out or until a cure is effected. Acute exacerbations are treated as in the acute stage. The unsatisfactory results and the necessarily prolonged course of the above line of treatment have gradually impressed themselves upon the profession until now it has come to be pretty generally recognized that trachoma is a surgical disease and should be so treated. The fact that some cases will get well under medical treatment does not invalidate the above any more than the fact that because some cases of appendicitis get well without operation appendicitis has not nevertheless ceased to be recognized as a strictly surgical disease. Of course, in making this statement one must draw a sharp distinction between trachoma, follicular conjunctivitis and other conditions with which it is often confounded. The diseases with which it is confounded may or may not be surgical. We have seen that follicular conjunctivitis may fail to clear up unless expression is employed. The more nearly that trachoma resembles follicular conjunctivitis, i. e., the granular form, the more easily and readily cured it is by such simple measures as expression, gratage, etc. One simple procedure, if it may be called simple, that is good in all forms of trachoma is multiple scarifications followed by vigorous rubbing in of bichlorid of mercury, 1 to 500, as practiced by many surgeons.

The more the papillary form predominates the more radical will the surgical measures employed have to be. In the chronic stage, with thick tarsus, hypertrophied, rough conjunctiva and pannus we have an ideal condition for surgical intervention. Also the same is true in the complications of trichiasis and entropion and their resulting complications. It is not the writer's desire to take up your time in reviewing the various surgical procedures advanced for the cure of trachoma, as all of you are doubtless familiar with them. Rather he desires to direct your special attention to the one operation that above all others deserves extended trial in the hands of all ophthalmologists having many cases of real trachoma to treat. He refers to the Kuhnt-Heisrath combined tarsal resection.

In modern times Benedict, in 1822, seems to have been the first surgically to remove the superior fornix for the cure of trachoma. Galezowski, in 1874, followed him by boldly excising the upper re-

trotarsal folds. Heisrath, of Koenigsberg, in 1882, proposed to combine removal of the superior fornix with resection of the adjoining tarsus. Vossius and Kuhnt have taken up the work and elaborated the details and indications. There have been many others to follow the lead thus made, but the procedure has never by far received that popularity which its intrinsic worth justly merits. In the United States this method of treatment has not been widely recommended. However, such men as Casey Wood, Brawley, Wootton, Crigler and others have called the attention of the profession to the very great value of this operation. In Texas, Thompson, of Fort Worth, has done more to popularize this method than any other man in the State. In the writer's opinion there should be many more enlisted in the cause so that finally every up-to-date ophthalmologist should fully appreciate the merits and make full use of this operative procedure where indicated. There has not been a full and correctly formed appreciation of the indications. Neither does the writer presume to be able to add much to what has been written already on the subject. One thing is very sure, the old cases with thick, rough conjunctival surfaces, pannus, thick tarsal cartilages will yield almost like magic. In the treatment of that most distressing complication of trachoma, trichiasis and entropion, this operation properly performed is incomparably good. The worse the tropion and trichiasis the more radical should be the operation. In the worst cases one should leave very little of the lower tarsal border, i. e., a very narrow margin only is left. The writer presumes that all are familiar with the steps of this operation, hence only some of the special features in it will be reviewed and stressed. If only one eye is to be operated upon it can be done under local anesthesia in suitable cases. If both eyes are involved general anesthesia will be necessary. Special forceps to evert the upper lid facilitate the operation. The first incision is made above the diseased area regardless of whether this corresponds to the upper border of the tarsus or not. The bulbar conjunctiva is now undermined for several millimeters and from three to five double-armed sutures are passed. In making the lower incision (upper, on the everted lid) the middle portion should curve upward very slightly, to give added support to the lid border to preserve its natural curve. This incision at all times is placed below (above, in the everted lid) the subtarsal sulcus, which is unduly exaggerated in practically all old trachomatous cases. If this precaution is not observed the condition and position of the lid and its border will be found in many cases not to be materially improved. If the operation has been properly performed the free border of a formerly greatly in-turned upper lid will be found to be everted to almost any extent desired by the operator. Thereby, of course, the eye is relieved not only of most of the disease-bearing area, but also of the irritation produced by the roughened lid and the in-turned lid border with its lashes. The pannus and all other complications as a rule speedily improve. It will be found rarely necessary to operate upon the lower eye lid. Sometimes one will be called upon to remove the plica semilunaris and also the tear sac on account of disease, as their presence tends to favor repeated recurrence. These measures will evidently rarely be found necessary.

As to the advisability of this operation in acute cases, opinion seems to be almost unanimously against it. The writer's experience here is small, but he feels that, in spite of the opinion of many to the contrary, it has a decided place in acute trachoma of the papillary variety. Wootton unhesitatingly urges the operation under such conditions. However, the usual treatment as outlined above should be given a full opportunity. This failing, operative measures may then be urgently advised and amongst such the combined tarsal resection easily takes first place.

In conclusion, the real objects of this brief paper have been to stress two or three points,—namely, the differentiation between follicular conjunctivitis and trachoma, the surgical treatment of trachoma, and if surgery is employed let the measures be radical. It has seemed to the writer that the confusion existing between follicular conjunctivitis and trachoma is very widespread and that many of our best men are uncertain in the matter. No other conclusion is possible when

one reads of their wonderful cures under this or that simple surgical procedure. Also the idea prevailing that so many of our children in school have trachoma arises without doubt from this same confusion. The writer has had ample opportunity to examine many cases so diagnosed that were not trachoma at all, but follicular conjunctivitis. A wrong diagnosis of this kind is a real handicap and burden in many ways, both to the child and to the parent, and therefore should not be made. When real trachoma exists, however, they should be frankly told and it should be impressed upon them that the disease is a very serious one and that radical measures may have to be employed to effect a cure, if indeed a cure is possible in the particular case. This, of course, will depend upon the many conditions surrounding the case.

DIPHTHERIA INVOLVING THE SINUSES, MASTOID, AND MIDDLE EAR*

By Frank Vinsonhaler, M.D.,
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The infection of the sinuses in diphtheria occurs always secondarily to the diphtheritic involvement of the nasal mucous membrane, extension taking place through the natural openings. The involvement of the sinuses is signalized by no unusual symptoms aside from pain, rise in temperature and ordinary function of sinus involvement.

In many cases of nasal diphtheria there is an absence of the membrane, and nothing in the appearance of the tissues to justify the suspicion of diphtheria.

Hajek has recorded cases of scarlatina in which the infection took place through the blood vessels and the lymphatics and through the openings in the sinuses.

Diphtheritic involvement of the sinuses is not common or at least it has not been mentioned often in the medical literature. Pierce, who is authority for this statement, says that it is by no means uncommon in nasal diphtheria. Most cases of nasal diphtheria occur in children in whom the sinuses are not fully developed. The infrequency of sinus involvement can be easily understood in nasal diphtheria, as the inflammatory process differs from the faucial form in that the temperature is lower and the toxic manifestations less profound.

Otitis media as a complication of diphtheria is uncommon. The writer had the opportunity of seeing during pre-antitoxin days the most virulent types of this disease in which the mortality rate was 33%, and did not see a single otitis case in over one hundred. The report of a case, therefore, in which otitis media complicated nasal diphtheria, possesses more than ordinary interest.

The case was one of rhinitis diagnosed la grippe and treated as such. At no time was the membrane visible in the nose nor was there much discharge. The symptoms were those of a rhinitis of moderate severity with afternoon temperature of 99.5° and morning temperature slightly subnormal. Otitis media occurred suddenly in the left ear without warning. The temperature rose to 101.5° in the afternoon; the membrane tympani ruptured; a rather profuse discharge began; and symptoms of toxemia, weakness, and lumbar pain came on.

A culture of the ear was made with the purpose of preparing an autogenous vaccine under belief that it was still la grippe. The presence of the Klebs-Loeffler bacillus was discovered. There was no swelling of the submaxillary or cervical glands at any time. Antitoxin was at once given. Temperature fell to normal in thirty-six hours and discharge from the ear ceased in five days. A piece of the diphtheritic membrane came away from the lower posterior quadrant of the drum and the adjacent meatus. This membrane was present about six days. Fortunately there was no labyrinthine involvement. The perforation healed in the drum and hearing was restored to 10/20, an unusual result in these cases where marked impairment is the rule. Repeated examination of the nose and throat by cultures failed after one week to reveal the diphtheritic bacillus.

It is my purpose to report the involvement of the maxillary and frontal sinuses, possibly diphtheritic, and the involvement of the middle ear following rapidly. The patient was one in whom a double mastoid operation had been done eight years before with the obliteration of the sigmoid sinus. There was a complete resection of the jugular vein on the right side.

*Read in Eye, Ear, Nose and Throat Section, Southern Medical Association, Ninth Annual Meeting, Dallas, Tex., Nov. 8-11, 1915.

This added to the gravity of the case, and especially the sinus involvement of the middle ear and mastoid trouble which occurred on the left side.

The patient was a woman, white, married and in good physical condition. She had been treated for several weeks by her family physician for la grippe, the principal symptom being subacute laryngitis, which proved very obstinate to treatment. Bacteriological examination revealed nothing but the presence of the pneumococcus. She was referred to me on account of the pain on the left side over the antrum and brow. The temperature was 99.2°. Examination revealed infection of the left antrum. There was a copious discharge, muco-purulent in character. There was nothing unusual in the appearance of the nose excepting the usual swelling accompanying a disease of the antrum. The maxillary chamber was washed with a solution of sterile normal salt and the patient was put to bed. The temperature was ranging from 99 to 101°. Thirty-six hours later there was involvement of the left frontal sinus, necessitating the removal of the anterior tip of the middle turbinate. Washing the frontal sinus gave relief from the pain. Following this procedure, the next night the patient was seized with pain in the ear. This was believed by the nurse to be due to the frontal sinus trouble and I did not see the patient until six hours later, when there was considerable pain. When I saw her I thought best to incise the drum freely under nitrous oxid. Notwithstanding the freedom of drainage obtained by the incision, the involvement of the antrum and the adjacent bony structures made it necessary to open the mastoid two days later. At the time of the incision through the drum it was believed that the infection had occurred through the eustachian tube from the solution used in washing out the sinus. The conditon was now serious. The temperature was 104° and the condition was one of profound toxemia and depression.

Bacteriological examination of the discharge of the ear was made with a view to obtaining an autogenous vaccine. The bacteriologist reported the presence of diphtheritic bacilli, and at the time of the mastoid operation 10,000 units of antitoxin were injected. The opening in the mastoid revealed infection of the antrum and involvement of the adjacent bone and periosteum. There was no membrane to be seen in the ear or mastoid. Sixteen hours after the operation and injection of the antitoxin, the toxic condition began to pass away; the temperature became normal; and the general condition began to improve. And in four days after the antitoxin the discharge from the sinus had ceased. The subsequent history of the case became that of ordinary mastoid operation.

A bacteriological examination made after seven days showed no evidence of the diphtheritic bacilli. This was repeated every two weeks with a view to determining any possible reappearance of the diphtheritic bacilli.

Such cases have been reported by the Board of Health. My purpose for reporting this case is to call attention to the possibility of latent nasal diphtheria which is especially dangerous because it is difficult to recognize. Also I wish to emphasize the advisability of frequent examinations of the nasal secretions of the cases in which the diagnosis is not clear.

DISCUSSION

Dr. W. T. Patton, New Orleans, La.—I want to cite one case that I had of a mastoid condition, which I operated upon for secondary simple mastoiditis. The case had been previously operated upon three times, but could never be made to heal. When it fell into my hands, I did a complete radical mastoid operation; went over it carefully; and was particularly careful to get everything out. In fact, I went so far even as to take a chance on getting the facial nerve. The wound healed nicely, and I was congratulating myself when the patient came back again, three or four weeks afterward. It was breaking down again. I decided to try vaccine. I sent to the laboratory a culture from which to make a vaccine. The report came back, "Pure culture Klebs-Loeffler bacillus." Now the pseudo-bacillus is very common in those conditions, but the true diphtheria bacillus is rather unusual. I had the vaccine made and after giving six injections the wound healed nicely. I was much pleased; but about a year later the patient returned again, and it was breaking down. I had several examinations made for diphtheria, which were all negative, but after careful search I found a tuberculous infection. However, I think she is improving again.

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Next Meeting, Atlanta, Ga., Nov. 13, 14, 15, 16, 1916

EDITORIAL DEPARTMENT

ATLANTA PREPAREDNESS

The "Atlanta spirit" is proverbial. It means that regardless of all personal differences the citizens of that great City all work together on any proposition that is for the good of Atlanta. The "Atlanta spirit" was in evidence at Dallas last November, when the representatives of Georgia's Capital City won, over a number of strongly competing cities, the 1916 Meeting of the Southern Medical Association. The "Atlanta spirit" is still in evidence in the preparations for the great medical convention to be held there next November, when the physicians of that City propose to prove that Atlanta deserves her reputation as a great convention city. The physicians of Atlanta are being ably assisted in their arrangements by a really great diplomat and convention specialist, Mr. Fred Houser, who was everywhere all the time at the Dallas Meeting.

Atlanta's big Auditorium-Armory has been given over to the doctors. All four sections can hold their meetings in the building at the same time. The Auditorium-Armory is located near the principal hospitals and the Atlanta Medical School in which clinics will be held every morning from 8 to 10, at which time the various section meetings will convene each day. The Atlanta committee has generously given the clinic hours from Monday to Thursday to distinguished clinicians from the sixteen Southern States; but on Friday and Saturday the physicians of Atlantta, who are connected with the various hospitals and sanitoria, and the Faculty of the Atlanta Medical College will hold clinics complimentary to the visiting doctors.

The programs for the four section meetings and the Railway Surgeons have been practically completed and all of the sixteen

Southern States are well represented. The Atlanta meeting, with its clinics added to the regular reading and discussion of papers, will give, without expense other than railroad fare and hotel accommodations, a week of the best post-graduate work ever offered to the medical profession of the states represented in the Southern Medical Association. The physician who goes to Atlanta, whether specialist or general practitioner, will find that the South has as great clinicians and as able men in all lines of work as any region of any country of the world.

All railroads east of the Mississippi River (comprising the Southeastern Passenger Association) have already granted reduced rates. In our next issue we hope to announce that railroads west of the Mississippi have done likewise.

We publish below the names of the Atlanta committees thinking that members of the Association may desire to write for information regarding the details for the meeting:

General Chairman, Dr. Stewart R. Roberts, Candler Building.

Finance, Dr. F. P. Calhoun, Candler Bldg.

Clinics, Dr. W. S. Elkin, Candler Bldg.

Membership, Dr. M. L. Boyd, Candler Bldg.

Alumni, Dr. C. W. Strickler, Candler Bldg.

Reception, Dr. F. K. Boland, Candler Bldg.

Publicity, Dr. E. C. Thrash, Candler Bldg.

Health Lectures, Dr. Marion McH. Hull, Grant Bldg.

Meeting Places, Dr. H. R. Donaldson, Grant Bldg.

Hotels, Dr. G. Pope Huguley, Atlanta National Bank Bldg.

Badges, Dr. J. E. Paullin, Peters Bldg.

Lights, Dr. J. S. Derr, Hurt Bldg.

Medical Section, Dr. J. H. Hines, Candler Bldg.

Surgical Section, Dr. James N. Ellis, Fourth National Bank Bldg.

Public Health, Dr. C. A. Smith, City Hall.

Ophthalmology, Dr. R. R. Daly, Empire Life Bldg.

Railway Surgeons, Dr. T. H. Hancock, 30 Crew Street.

Transportation, Dr. L. B. Clark, Peters Bldg.

Ladies Reception, Mrs. W. S. Elkin.

POLIOMYELITIS

Owing to the widespread attention that is now being paid to the subject of infantile paralysis, and because of our meagre knowledge of its prevention, we believe our readers will be interested in the following extracts from a circular issued by the Department of Health of the City of New York:

"Infantile paralysis (poliomyelitis) is a catching disease. How it is spread is not yet definitely known. In most cases the disease is probably taken directly from a sick person, but it may be spread indirectly through a third person who has been taking care of the patient, or children who have been living in the same household.

"The early symptoms are usually fever, weakness, fretfulness or irritability, and vomiting. There may or may not be acute pain at this time. Later, there is pain in the neck, back, arms or legs, with great weakness. If paralysis is to occur, it usually appears from the second to the fifth day after the sickness begins. Many cases do not go on to paralysis.

"The germ of the disease is present in discharges from the nose, throat, and bowels of those ill with infantile paralysis, even in the cases that do not go on to paralysis. It may also be present in the nose and throat of healthy children from the same family. Do not let your children play with children who have just been sick or who have or recently have had colds, Summer complaint, etc. For this reason children from a family in which there is a case of infantile paralysis are forbidden to leave their home. If you hear of their doing so, report it at once to the Department of Health.

"Persons over 16 years of age, from families where there are cases of poliomyelitis, may continue at work unless their business has to do with the preparation or handling of food or drink for sale.

"If you hear of a case in your neighborhood and the house is not placarded, notify the Department of Health.

HOW TO GUARD AGAINST THE DISEASE

"In order to prevent the occurrence of this disease, parents should observe the following rules:

"Keep your house or apartment absolutely clean.

"Go over all woodwork daily with a damp cloth.

"Sweep floors only after they have been sprinkled with sawdust, old tea leaves, or bits of news-

paper which have been thoroughly dampened. Never allow dry sweeping.

"Screen your windows against flies, and kill all flies in the house.

"Do not allow garbage to accumulate, and keep pail closely covered.

"Do not allow refuse of any kind to remain in your rooms.

"Kill all forms of vermin, such as bedbugs, roaches, and body lice.

"Pay special attention to bodily cleanliness. Give the children a bath every day and see that all clothing which comes into contact with the skin is clean.

"Keep your children by themselves as much as possible. Do not allow them to visit moving picture shows or other places where children may gather.

"Children should not be kept in the house; they should be outdoors as much as possible, but not in active contact with other children of the neighborhood. Do not take them on a street car, unless absolutely necessary, or shopping.

"Do not allow your children to be kissed.

"It is perfectly safe to let your children go to the parks and playgrounds if only two or three of them play together; they should not play in large groups, and you should not let them come into contact with children from other parts of the City.

"Remember that children need fresh air in the Summertime and outdoor life is one of the best ways to avoid disease.

"If there is a public shower bath in a school in your vicinity, send the older children there every day for a shower bath. This is perfectly safe and will help keep them in good health.

"Give your children plain, wholesome food, including plenty of milk and vegetables.

"Keep the milk clean, covered, and cold.

"Do not allow the milk or any other food to be exposed where flies may alight upon it.

"Wash well all food that is to be eaten raw."

It is hoped that the above will furnish a basis for advice to be given persons contemplating trips East with young children, and also to those in communities in the South where poliomyelitis is known to be present.

THE PATENT MEDICINE EVIL

The patent medicine trade is a criminal industry; it traffics in human health, even human life. It exploits sickness and suffering for the sake of gain. Some of these nostrums are the most vicious products of our age. They promise cures for incurable diseases; they cost lives by standing in the way of proper treatment; they create drug fiends. The claims of tonics, pills, balms, drops, are flaunted in the pages of reputable newspapers and magazines to the undoing of thousands of the poor and the unfortunate. The tired business man, run down from long hours, buys a "tonic;" the working girl carries "tablets" in her bag—"one every four hours;" the society dame in her limousine takes obesity pills; the unfortunate youth swallows the nauseous draught to restore "lost manhood;" and the manufacturer builds palatial palaces and gives a million now and then to his pet philanthropy.

Equally criminal are the quacks and fakers. They are guilty by trick and device of extortion, blackmail and grand larceny. The "permanent and painless cure for cancer," the instantaneous method of cure for rupture," the "treatment through *the eye* of consumption, fits, paralysis, Bright's disease and heart trouble" bear on their face the lying deceit and quackery of their authors. But these and many others of the same ilk flourish like the green bay tree of the Psalmist.

To quote from a recent article on patents, "Surely, it is a depressing spectacle to contemplate, because it means, for the most part, just this, — common, century-old stupidity. The apparently well-informed man who swallows a pill about which he knows nothing for a condition about which he knows less, is simply stupid."

But whether credulity, ignorance or stupidity, it is the duty of the health officer to run down the quack; to expose the fraudulency of these cheap concoctions, generally salts, starch, soap, sugar, alcohol, etc., and to give publicity to the methods, devices and absurd claims of the mail

order "institute" and the "medical" professor.

Eight states, of which Louisiana is one, have adopted the Printers Ink Bill verbatim, and twelve with some modifications. It provides that any person or organization making false statements in advertising goods for sale is guilty of a misdemeanor. No law of recent years is more beneficent in intent and of greater value in the production of the health and lives of the people. Millions of dollars are spent every year for nostrums; millions of the poor are cheated and deceived. It is the obligation of physician, and layman alike, to join forces against this nefarious traffic.

JOHN BENJAMIN MURPHY

As the JOURNAL is about to go to press, news comes of the death of John B. Murphy, of Chicago. The particulars are not stated. What that means to surgery, to the world! Murphy the surgeon, Murphy the genius, Murphy the teacher, Murphy the author, Murphy the leader of men,—in each line supreme!

A prolific writer, no surgeon in America has ever attracted such wide attention abroad as he. His work on lung compression by nitrogen for pulmonary tuberculosis, his saline drip method of proctoclysis, his work on appendicitis, his masterful contributions to bone and intestinal surgery, and dozens of other original pieces of work, have won for him a lasting place in surgery.

If there ever was a clearer, more forceful or more logical teacher than he, it has certainly not been our good forune to meet him.

Dogmatic? Yes, to an extreme. But skilled as a diagnostician and operator, brilliant as a teacher, and forceful as a writer, surely no man in America can fill the great gap that has been created by his sad departure.

WALTER REED

The thirteenth of this month (September) marks the sixty-fifth anniversary of the birth of one of America's greatest contributors to medical science. France has furnished her Pasteur (who himself was not a physician), England her Jenner and Lister, Germany her Koch and Ehrlich, and America her Crawford W. Long, Marion Sims, Walter Reed, and Simon Flexner, the latter being natives of Georgia, South Carolina, Virginia, and Kentucky, respectively.

There is a movement on foot at the University of Virginia to erect a memorial to Walter Reed, who was a distinguished son of that institution. It is further proposed to invite every nation which has directly benefited by the solution of the transmission and consequent prevention of yellow fever, to contribute a native stone to the structure which will probably take the form of "a large curving plinth, perhaps fashioned in the form of a seat, with a high back, an ornamental pediment, and a stone-flagged pavement in front."[1]

Such a plan is indeed unique and should result in a most beautiful and interesting structure. It is hardly likely that any country will fail to avail itself of the opportunity of showing its indebtedness to "a man who brought happiness and safety and health not only to his own land, but to all the tropical and subtropical countries of the world; who was the means of saving in a decade and a half more lives than were lost in the wars of Napoleon; who made possible the opening up and settlement of millions of square miles of the most fertile and beautiful regions of the

1. University of Virginia Alumni News, IV, 19, pp. 224-226.

globe, which before his advent had been cursed with a mortal plague."[2]

It was in the U. S. P. H. and Marine Service that Reed was destined to gain immortality. In 1900, as head of a Yellow Fever Commission, consisting of himself, Dr. Jesse W. Lazear, Dr. James Corroll, and Dr. Aristides Agramonte, he was sent to Cuba to investigate that dread disease. And it was there that he proved experimentally that the mosquito (species stegomyia fasciata) is the intermediate host, and that it alone transmits the disease to man.

The account of this work reads like a novel, and represents one of the most classical examples of scientific investigation ever undertaken. The martyrdom of brave Lazear who sacrificed his own life to science is too well known for rehearsal here. It was this discovery that made possible the building of the Panama Canal.

Ever honest and modest, Reed says: "To Dr. Carlos Finlay, of Havana, must be given, however, full credit for the theory of propagation of yellow fever by means of the mosquito, which he proposed in a paper read before the Royal Academy in that City at its session on the 14th day of August, 1881."[3]

It might here be mentioned in passing that even prior to Finlay, others had expressed the opinion that the mosquito was the transmitter of that disease. Among them was Dr. J. C. Nott, of Mobile, Ala., who published this theory in the "New Orleans Medical Journal" for March, 1848.

But where others had merely suspected the fact or had failed outright in their experiments, Reed actually proved it to be the case, and it is his name that will live as long as medical history is written; for it was he who rendered an everlasting service to mankind in saving not only thousands of lives annually during the present generation, but millions in the countless ages to come.

It is fitting that the sons of the great University, in which Dr. Reed received his first medical training, should erect a monument to commemorate his remarkable achievements; and it is hoped that the unique plan suggested by an alumnus, may be successfully carried out.

2. Kelly, Howard A.: "Walter Reed and Yellow Fever." pp. 6-7.
3. Surgeon-General William C. Gorgas: "Sanitation in Panama." Appleton, pp. 14-15.

NEW BOOKS BY MEMBERS OF THE SOUTHERN MEDICAL ASSOCIATION

NERVOUS CHILDREN—TUCKER[1]

Dr. Beverly R. Tucker has gotten out a small volume on "Nervous Children." It is a topic to which hitherto too little attention has been paid. This contribution is therefore a timely one, and deals with the subject in language simple enough to be appreciated by the laity. It not only treats of the nervous child, but what is still more important, the *prevention* of nervous conditions. Dr. Tucker, always practical, has, from his wide experience with nervous children, written a classic that should be read by parents who desire to rear strong, healthy children. It may also be read by physicians with interest and profit.

INFANT FEEDING—ROYSTER[2]

Dr. L. T. Royster has prepared a small handbook on infant feeding, as he says, "to furnish the essentials and only the essentials of infant feeding in a compact and succinct form." It is an outline for the busy practitioner who is unable to glean the literature as has the author, but who

1. "Nervous Children: Prevention and Management." By Beverley R. Tucker, Richmond, Virginia. Boston: Richard G. Badger. Cloth, $1.25.
2. "A Handbook of Infant Feeding." By Lawrence T. Royster, Norfolk, Virginia. St. Louis: C. V. Mosby Co.

wishes the latest advice of the best authorities. Dr. John Lovett Morse has furnished the excellent chapter on "The Stools in Infancy." The little volume is very helpful.

DISEASES OF THE SKIN—HAZEN[3]

Dr. Hazen's book on dermatology recommends itself especially to students and general practitioners as contrasted with larger works which appeal only to the specialist. It emphasizes the commoner diseases, omitting lengthy discussions of rare lesions.

Dermatoses in Negroes, so frequently encountered in this section of the country, are handled with a completeness never before equalled by any book we have seen.

The many cuts of the commoner diseases, including histopathological sections, render the description much more intelligible to the average doctor who is apt to feel quite at sea when called upon to treat a skin lesion.

The only serious criticism we care to make is that Dr. Hazen underrates the great dermatological value of radium in general, asserting that all its virtues are equalled or excelled by some other form of therapy. To that we wish to take exception.

Those who are so fortunate as to have a sufficient amount of radium know that therapeutically it equals the X-ray in every respect and that its percentage of cures is greater in most instances, the results being accomplished with fewer applications and consequently with less discomfort and danger. Furthermore, a point well worth considering is the fact that in obstinate cases requiring massive treatment either of X-ray or radium, where a risk is run of an "irritation," should a burn occur it is comforting to know that no case has yet been reported of a cancer's originating primarily in a radium burn. In spite of the fact that Dr. Hazen contradicts our experience with radium, we are pleased with his little book.

3. "Diseases of the Skin." By Henry H. Hazen, Washington, D. C. St. Louis: C. V. Mosby Co.

PHYSICS AND CHEMISTRY FOR NURSES—BLISS AND OLIVE[4]

As time goes on physicians are coming to realize that the better educated and trained their nurses become, the more intelligent coöperation will they be able to lend.

Realizing the lack of uniformity and system in the teaching of physics and chemistry to nurses, Professors Bliss and Olive, determined to write a text-book embracing their wide pedagogic experience in those branches. When the work was begun there were no books devoted exclusively to those subjects. However, since then several have appeared.

The essentials are stated in a manner easily to be grasped by young women whose preliminary training differs very widely in thoroughness and whose time is usually quite limited for study. The authors are to be congratulated upon producing a remarkably clear treatise, simple, concise, and to the point. We predict for this little book a great success.

4. "A Text-Book of Physics and Chemistry for Nurses." By A. R. Bliss, Atlanta, Ga., and A. H. Olive, Birmingham, Ala. Philadelphia: J. B. Lippincott Co.

WELFARE WORK AMONG CORPORATIONS

Now that the toll of human life has become so great in the industrial world, anything calculated to create comfort for employees, to prolong life, or to reduce mortality, is always of interest and importance.

The August issue of "The Modern Hospital" constitutes a symposium on "Welfare Work Among Corporations," practically the whole of the number being de-

voted to the various branches of insurance companies; welfare work, safety devices, first aid, etc., in the iron and steel industry; the provision for medical care under health insurance; the automobile industry; the same as applied to sheet and tube making; improvements connected with the cloak and suit industry; the shoe machinery factories; the department store; and the telephone companies. Recreation facilities are likewise considered.

"The Modern Hospital," at all times a high class, splendid publication, in this number has quite eclipsed itself. It will be found a thorough discussion of an all-important subject in its many phases.

BOOK REVIEWS

Gynecology

By William P. Graves, M.D., F.A.C.S., Professor of Gynecology, Harvard Medical School. 770 pages with 424 original illustrations, 66 in colors. Philadelphia and London: W. B. Saunders Co., 1916. Cloth, $7.00.

Dr. Graves divides his book like the geography of Gaul of old into three parts: "Part I, Physiology and Relationship of Gynecology to the General Organism;" "Part II, Gynecologic Diseases;" and "Part III, Operative Gynecology."

The fullness of the discussion of the physiology of the subject marks a new departure from the beaten path usually followed by writers of text-books upon gynecology.

The second division is arranged primarily for the student who must have his data in concise yet comprehensive form for preparing for recitations and examinations.

As regards the third or operative section of the book, it not only gives the most tried and approved technique for pelvic and perineal surgery, but it quite helpfully embraces those kindred subjects so often encountered and so frequently included by the gynecologist in his specialty,—namely, kidney, ureteral, bladder and urethral diseases, as well as abdominal hernias, rectal diseases and varicose veins. In this connection it is to be regretted that not even short discussions are included on the technique of the all-important subjects of cystoscopy, ureteral catheterizations, pyelography, cholecystectomy, appendectomy and diseases of the breast, thus rendering the list of allied topics complete.

The illustrations, strange to say, are in most cases drawn by the author himself, and while by no means in the Max Broedel class, are nevertheless both clear and explanatory. Many microscopic plates are also shown depicting histological and pathological tissues.

We believe without any exception that Dr. Graves has produced the best and most complete single volume on gynecology, certainly in the English if not in any language.

Studies in Ethics for Nurses

By Charlotte A. Aikens. 320 pages. Philadelphia and London: W. B. Saunders Co., 1916. Cloth, $1.75.

It is a study of the profession of nursing from its various viewpoints, i. e., the characteristics necessary for nursing, the cost of training, the responsibilities of the nurse and the opportunities open to nurses after graduation. The tendency of the author in offering solutions for many of the practical problems confronting nurses is to emphasize the fact that, since nursing is primarily to help one's fellow beings, "the spirit of helpful service" should be the guiding principle of the nurse.

The Kinetic Drive

Its Phenomena and Control. By George W. Crile, M.D., Professor of Surgery, Western Reserve University. Octavo, 71 pages. Illustrated. Philadelphia and London: W. B. Saunders Co., 1916. Cloth, $2.00.

This monograph in substantially the same form was read before the New York Academy of Medicine on October 7, 1915, and, although no mention is made of that fact in the book, was published in the Journal of the American Medical Association, Dec. 18, 1915.

It brought forth rather severe and caustic criticism and some favorable comment in the correspondence columns of that periodical. In turn they were answered by Dr. Crile. Physiologists alone attacked the theory, claiming that it was built upon too flimsy a foundation, that it was in some instances based upon unconfirmed work, and that the actual experiments substantiating the formulation of the kinetic theory had best be offered the public by the author before elaborating in such great detail his deductions.

By the kinetic system the author refers to the adrenals, the liver and the thyroid which produce internal secretions representing the body's kinetic energy. When these are overworked, the system undergoes increased oxidation and consequently produces a condition of acidosis, which brings about certain definite changes in these organs themselves, as well as in the cerebellum. Crile shows many plates of photomicrographs of such examples. He claims that anesthesia (especially with ether), fatigue, and psychic strain will produce the same results. The Europeans of the present time he cites as examples of this kinetic drive.

Like most of Crile's writings, it is his oft-times expressed ideas in a made-over garb, but one which is nevertheless quite becoming. The book is very well written and is stimulating to a degree.

A Text-Book of Pathology

By William G. MacCallum, M.D., Professor of Pathology, College of Physicians and Surgeons, Columbia University, New York City. 1085 pages with 575 original illustrations. Philadelphia and London: W. B. Saunders Co., 1916. Cloth, $7.50.

As the author plainly states in his preface, the book is not intended for a reference work, but represents the course of pathology given in the College of Physicians and Surgeons of Columbia University, New York.

The full and scholarly manner in which Dr. MacCallum has handled the subject gives every evidence of the thoroughness of his course. The illustrations are exceptionally clear. We don't know when we have been so impressed by the practical nature of a text-book on pathology.

Surgical Operations With Local Anesthesia

Second Edition, by Arthur E. Hertzler, A.M., M.D., Ph.D., F.A.C.S., Surgeon, Halstead Hospital, Kansas, and to the Swedish and General Hospitals, Kansas City, Mo. 327 pages with 173 illustrations. New York: Surgery Publishing Co., 1916. Cloth, $3.00.

This second edition has been enlarged from a small work in local anesthesia on minor surgery to a full discussion of its application to major surgery as well. The descriptions are clear and the illustrations good.

Minute details are given of operations of many kinds.

The Art of Anaesthesia

By Paluel J. Flagg, M.D., Lecturer in Anaesthesia, Fordham University Medical School; Anaesthetist to Roosevelt Hospital, etc. 341 pages with 136 illustrations. Philadelphia and London: J. B. Lippincott Co., 1916. Cloth, $3.50.

Following a brief historical discussion of anaesthesia the author covers the whole field, including inhalation, local, spinal, rectal anaesthesia, etc., as well as a number of kindred topics, such as preliminary medication, post-operative treatment, carbon dioxid and rebreathing, and many other subjects too numerous to mention. It is a very thorough book, written by a man of wide experience.

Examination of the Urine and Other Clinical Side-Room Methods

By Andrew Fergus Hewat, M.B., Ch.B., M.R.C.P., Ed., Tutor in Clinical Medicine, University of Edinburgh; Lecturer Edinburgh Post-Graduate Vacation Course. Fifth Edition. 212 pages. Illustrated. New York: Paul B. Hoeber. Cloth, $1.00.

The points to be commended in this little book are: its vest-pocket size, the fact that it not only deals with urinalysis but also with blood, sputum, pus, gastric contents, and feces examinations, and the fact that it is well indexed. It contains a great deal of helpful information in a very small space.

The Straight Methods of Direct Laryngoscopy, Bronchoscopy and Esophagoscopy

By Richard Hall Johnston, M.D., Baltimore, Md., 1915.

In this monograph, which was originally published in the American Journal of Surgery, the author has not only presented the matter directly suggested by his title, but he has included a great many related topics in the field of laryngo-broncho-esophagoscopy. To such an extent is this true that with the addition of an index one would have in the volume a very valuable reference book. The clinical reports and interspersed illustrations render it a very enlightening work.

Infections of the Hand

A Guide to the Surgical Treatment of Acute and Chronic Suppurative Processes in the Fingers, Hand and Forearm. By Allen B. Kanavel, M.D., Assistant Professor of Surgery, Northwestern University Medical School; Attending Surgeon, Wesley and Cook County Hospitals, Chicago. Third Edition; Thoroughly Revised. Illustrated with 161 Engravings. Philadelphia and New York: Lea & Febiger, 1916. Cloth, $3.75.

The appearance of this new edition is most welcomed, for it offers in improved form what was already one of the most valuable contributions to American surgical literature. The need of a special treatise upon this important subject is well illustrated by a statement of the author, who says: "I think that in three-fourths of the hands I see in which treatment has been instituted, a number of unnecessary and improper incisions are found upon the dorsum." The revision, while general, includes in particular the addition of a chapter upon "The Relation of Acute Infective Processes to Industrial Pursuits" and one upon "Plastic Procedures Instituted for the Correction of Deformities."

1915 Collected Papers of the Mayo Clinic, Rochester, Minn.

Octavo, 983 pages, 286 illustrations. Philadelphia and London: W. B. Saunders Co., 1916. Cloth, $6.00.

The fact that these articles have all appeared elsewhere, in no wise detracts from the value of the volume, as their original appearances in many cases were in journals and not accessible for the average reader.

In this book are the clinical and experimental observations of the staff members upon a great variety of subjects. Some of the reports cover original investigation. It is indeed a wonderful collection of papers.

Surgical and Gynecological Nursing

By Edward Mason Parker, M.D., F.A.C.S., Surgeon to Providence Hospital; and Scott Dudley Breckinridge, M.D., F.A.C.S., Gynecologist to Providence Hospital, Washington, D. C. 425 pages, with 134 illustrations. Philadelphia and London: J. B. Lippincott Co., 1916.

Not only have the authors treated in a thoroughly capable manner the conventional subjects which one would expect in such a volume, but they have also included a number of borderline topics, such as Infection, Surgical Pathology, Fractional Doses in Hypodermic Medication, Charts and Records, Selection of Instruments for Operations, Operations in Private Houses, the Gynecological Dispensary, and Emergencies. The book furnishes a wealth of information which should prove invaluable both to the nurse herself and to those whose duty it becomes to teach surgical and gynecological nursing.

Roentgenographic Diagnosis of Dental Infection in Systemic Diseases. By Sinclair Tousey, A.M., M.D., Consulting Surgeon to St. Bartholemews Clinic, New York. New York: Paul B. Hoeber Co., 1916. Cloth, $1.25.

Much attention has been drawn lately to the relation of peridental abscess and other oral infections to systemic disease. This excellent little book offers to the profession, in truly delightful style and accompanied by a profusion of prints from dental Roentgenograms, the latest facts in regard to this subject. The author and publishers are to be congratulated upon the worth and simplicity of the subject matter and the evidences of technical skill displayed in the assembling of the text.

The Medical Clinics of Chicago, July, 1916, Vol. II, No. 1. Published bi-monthly. Philadelphia and London: W. B. Saunders Company. Price per year, $8.00.

Each number of this series is a book of over 200 pages bound in brown paper and containing the detailed clinical study of a number of cases in ten clinics. The subject matter is presented in a very pleasing style and each case is well worked up and worth the consideration of the practitioner. This method of study is one of the most modern and valuable means of acquiring information and gives for a few dollars opportunities of study which would cost much more under other conditions.

Among the many other interesting cases presented in this number is one on which the principles of Fluoroscopy of the Stomach is demonstrated by Dr. James T. Case, St. Luke's Hospital, Chicago. The study of the material contained in these volumes never fails to give food for thought and investigation.

Blood Pressure: Its Clinical Applications. Second edition, revised and enlarged. By George W. Norris, A.B., M.D., Assistant Professor of Medicine in the University of Pennsylvania, Visiting Physician to the Pennsylvania Hospital; Assistant Visiting Physician to the University Hospital; Fellow of the College of Physicians of Philadelphia. Octavo 424 pages with 102 engravings and 1 colored plate. Philadelphia: Lea & Febiger, 1916. Cloth, $3.00.

This is a very exhaustive study of a subject which has only recently received its merited share of attention. After considering the different methods of measurement of blood pressure. the author proceeds with the consideration of hypo- and hyper-tension and the relation of certain diseases to those phenomena and after giving the indications for treatment in the different conditions closes with a very interesting chapter on "The Effect of Drugs and Glandular Extracts on Blood Pressure." This book abounds in both experimental and clinical data, though well balanced throughout. The chapter on "Nephritic Hypertension" will prove of especial interest to the practitioner.

Diseases of Infants and Children. By Henry Dwight Chapin, A.M., M.D., Professor of Diseases of Children of the New York Post-Graduate Medical School and Hospital, etc., and Godfrey R. Pisek, M.D., Sc.D., Professor of Diseases of Children and Attending Physician to the New York Post-Graduate Medical School and Hospital; Professor of Diseases of Children at the University of Vermont Medical College. Third edition, revised, with 179 cuts and 12 colored plates. New York: William Wood & Co. Cloth, $3.25.

This book, now in its third edition, goes into more detail in regard to the handling of pediatric problems and concerning the laboratory and other tests peculiar to this branch than most books on the subject, and the section on infant feeding is of particular value. The subject matter is presented in an interesting manner and from an extremely practical standpoint. It should prove very useful to those wishing to improve their work along this line.

Practical Oral Hygiene Prophylaxis and Pyorrhea Alveolaris. By Robin Adair, B.S., M.D., D.D.S., Professor of Oral Prophylaxis and Pyorrhea Alveolaris, Southern Dental College, Atlanta, Ga. (1911-1913); Oral Surgeon, Grady Hospital (1910-1912); Oral Surgeon to Georgia Baptist Hospital. Second Edition, Enlarged and Revised. Illustrated. Atlanta: Oral Hygiene Publishing Co., 1915.

Important changes have been made in this edition as regards the typography as well as the substance. These revisions are especially important in the sections dealing with the bacteriology and parasitology of pyorrhea, and in those discussing dentistry in school clinics.

In this book Dr. Adair offers the most thorough discussion of the subject which has yet appeared. It must be a source of gratification to us all to feel that such an authoritative work should have been produced in our section of the country.

BOOKS RECEIVED

Pellagra. An American Problem. By George M. Niles, M.D., Gastroenterologist to the Georgia Baptist Hospital, Wesley Memorial Hospital, and Atlanta Hospital, Atlanta, Ga. Second Edition. 261 pages. Illustrated. Philadelphia and London: W. B. Saunders Co., 1916. Cloth, $3.00.

Principles and Practice of Medicine. By Arthur R. Edwards, A.M., M.D., Professor of the Principles and Practice of Medicine and Dean of the Faculty, Northwestern University Medical School, Chicago; Attending Physician, Michael Reese Hospital, etc. Third Edition, thoroughly revised and rewritten. 1022 pages. Illustrated with 80 engravings and 23 plates. Philadelphia and New York: Lea & Febiger, 1916. Cloth, $5.50.

The Treatment of Acute Infectious Diseases. By Frank Sherman Meara, M.D., Ph.D., Professor of Therapeutics, Cornell University Medical College, New York City. Attending Physician, Bellevue Hospital, New York. 540 pages. New York: The Macmillan Company, 1916.

Mosquito Control in Panama. The Eradication of Malaria and Yellow Fever in Cuba and Panama. By Joseph A. LePrince, C.E., A.M., Chief Sanitary Inspector, Isthmian Canal Commission, 1904-1914; and A. J. Orenstein, M.D., Assistant Chief Sanitary Inspector, Isthmian Canal Commission, with an Introduction by L. O. Howard, LL.D., Entomologist and Chief, Bureau of Entomology, United States Department of Agriculture. 335 pages, with 100 illustrations. New York and London: G. P. Putnam's Sons, 1916. Cloth, $2.50.

Venereal Diseases: A Manual for Students and Practitioners. By James R. Hayden, M.D., F.A.C.S., Professor of Urology, College of Physicians and Surgeons, Columbia University, New York; Visiting Genito-Urinary Surgeon, Bellevue Hospital; Consulting Genito-Urinary Surgeon, St. Joseph's Hospital, Yonkers, N. Y. Fourth Edition, Thoroughly Revised. 365 pages. Illustrated with 133 engravings. Philadelphia and New York: Lea & Febiger, 1916.

The Basis of Symptoms: The Principles of Clinical Pathology. By Dr. Ludolph Krehl, Ordinary Professor and Director, Medical Clinic, Heidelberg. Authorized Translation from Seventh German Edition. By Arthur Friederic Beifeld, Ph.B., M.D., Instructor in Medicine, Northwestern University Medical School, Chicago. With Introduction By A. W. Hewlett, M.D., Professor of Internal Medicine, University of Michigan, Ann Arbor. Third American Edition. 517 pages. Philadelphia and London: J. B. Lippincott Company. Cloth, $5.00.

Infant Feeding and Allied Topics. For Physicians and Students. By Harry Lowenburg, A.M., M.D., Assistant Professor of Pediatrics, Medico-Chirurgical College of Philadelphia; Pediatrist to Mt. Sinai Hospital; Pediatrist to Jewish Hospital; Pediatrist to Jewish Maternity Hospital; 382 pages. Illustrated. 64 Engravings and 30 Original Plates, 11 in Colors. Philadelphia and London: F. A. Davis Company, 1916.

Pulmonary Tuberculosis. By Maurice Fishberg, M.D., Clinical Professor of Tuberculosis, University and Bellevue Hospital Medical College; Attending Physician, Montefiore Home and Hospital for Chronic Diseases, New York. 639 pages, 91 engravings and 18 plates. Philadelphia and New York: Lea & Febiger, 1916. Cloth, $5.00.

Manual of Vital Function Testing Methods: Their Interpretation. By Wilfred M. Barton, M.D., Associate Professor of Medicine, Medical Department, Georgetown University; Attending Physician, Georgetown University Hospital and Washington Asylum Hospital. 255 pages. Boston: Richard G. Badger, and Toronto: Copp Clark Co., Limited. Cloth, $1.50.

International Clinics. Volume II. Twenty-sixth Series, 1916. 311 pages. Philadelphia and London: J. B. Lippincott Co.

Rules for Recovery from Pulmonary Tuberculosis. A Layman's Handbook of Treatment. By Lawrason Brown, M.D. Second Edition, Thoroughly Revised. 184 pages. Philadelphia and New York: Lea & Febiger, 1916. Cloth, $1.25.

Refraction of the Human Eye and Methods of Estimating the Refraction. Including a Section on the Fitting of Spectacles and Eye-Glasses, etc. By James Thorington, A.M., M.D., Emeritus Professor of Diseases of the Eye, Philadelphia Polyclinic and College for Graduates in Medicine; Member American Ophthalmological Society; Fellow College of Physicians of Philadelphia, etc. 407 pages. 344 Illustrations; 75 Colored. Philadelphia: P. Blakiston's Son & Co. Cloth, $2.50.

Ophthalmoscopic Diagnosis for General Practitioners and Students. By George W. Jean, A.B., M.D., Instructor in Ophthalmoscopy and External Diseases of the Eye, School of Ophthalmology, New York Eye and Ear Infirmary; Assistant Surgeon, New York Eye and Ear Infirmary; Instructor of Ophthalmology, University and Bellevue Hospital Medical College. 123 pages. 68 illustrations. London, New York and Paris: E. B. Meyrowitz, Inc.

The Principles and Practice of Perimetry. By Luther C. Peter, A.M., M.D., F.A.C.S., Associate Professor of Ophthalmology, Philadelphia Polyclinic and College for Graduates in Medicine; Ophthalmologist, Rush Hospital for Consumption and Allied Diseases. 232 pages. Illustrated; 119 Engravings. Philadelphia and New York: Lea & Febiger, 1916.

The Health-Care of the Growing Child. His Diet, Hygiene, Training, Development and Prevention of Disease. By Louis Fischer, M.D., Author of "The Health-Care of the Baby," etc.; Attending Physician in Charge, Babies' Wards, Sydenham Hospital; and Willard Parker and Riverside Hospitals; Former Instructor in Diseases of Children, New York Post-Graduate Medical School and Hospital, etc. 341 pages. New York and London: Funk & Wagnalls Co., 1915. Cloth, $.75.

How to Live. Rules for Healthful Living Based on Modern Science. Authorized by and Prepared in Collaboration with Hygiene Reference Board of the Life Extension Institute. By Irving Fisher, Chairman, Professor of Political Economy, Yale University, and Eugene Lyman Fisk, M.D., Director of Hygiene of the Institute. A Foreword by William Howard Taft. New York and London: Funk & Wagnalls Co.

Your Baby. A Guide for Young Mothers. By Edith B. Lowry, M.D., Author of "Herself," "The Home Nurse," etc. 254 pages. Chicago: Forbes & Co. Cloth, $1.00.

Plague: Its Cause and the Manner of its Extension, Its Menace, Its Control and Suppression, Its Diagnosis and Treatment. By Thomas Wright Jackson, M.D., Member American Red Cross Sanitary Commission to Serbia, 1915; Lately Captain and Assistant Surgeon, U. S. Volunteers; Lately Lecturer on Tropical Diseases, Jefferson Medical College; Member of Manila Medical Society and Philippine Islands Medical Association; Director, Department of Sanitation and Epidemiology, H. K. Mulford Company; with Bacteriological Observations. 192 pages. Illustrated. Philadelphia and London: J. B. Lippincott Company.

The International Medical Annual. A Year Book of Treatment and Practitioners' Index. Thirty-fourth Year. 735 pages. New York: William Wood & Co., 1916. Cloth, $4.00.

Diseases of the Digestive Tract and Treatment. By A. Everett Austin, A.M., M.D., Former Professor of Physiological Chemistry, Tufts College, University of Virginia and University of Texas; Present Assistant Professor of Clinical Medicine, in charge of Dietetics and Gastro-Intestinal Diseases, Tufts College. 552 pages. 85 illustrations, 10 Colored Plates. St. Louis: C. V. Mosby Co., 1916.

Elementary Bacteriology and Protozoology. For the Use of Nurses. By Herbert Fox, M.D., Director, William Pepper Laboratory of Clinical Medicine, University of Pennsylvania. Second Edition, Revised and Enlarged. 251 pages, with 68 engravings and 5 colored plates. Philadelphia and New York: Lea & Febiger, 1916. Cloth, $1.75.

Modern Medicine and Some Modern Remedies. Practical Notes for the General Practitioner. By Thomas Bodley Scott, Author of "The Road to a Healthy Old Age." With a Preface by Sir Lauder Brunton, Bart., F. R. S. 159 pages. New York: Paul B. Hoeber, 1916. Cloth, $1.50.

Diseases of the Skin. By Richard L. Sutton, M.D., Professor of Diseases of the Skin, University of Kansas School of Medicine; Former Chairman Dermatological Section American Medicine Association; Assistant Surgeon, United States Navy, Retired; Dermatologist, Christian Church Hospital. 916 pages. 693 illustrations and 8 Colored Plates. St. Louis: C. V. Mosby Company, 1916.

A Manual of Practical Laboratory Diagnosis. By Lewis Webb Hill, M.D., Graduate Assistant, Children's Hospital, Boston. 179 pages. With 11 Figures and 2 Plates, in Colors. Boston: W. M. Leonard, 1916.

Ultra-Violet Light by Means of the Alpine Sun Light. Treatment and Indications. By Hugo Bach, M.D., Bad Elster, Saxony, Germany. Authorized Translation from the German. 114 pages. New York: Paul B. Hoeber, 1916. Price, $1.00.

Diseases of the Eye. By George E. de Schweinitz, M.D., Ll.D., Professor of Ophthalmology, University of Pennsylvania. Eighth Edition, Thoroughly Revised and Enlarged. 754 pages. 386 text illustrations and seven lithographic plates. Philadelphia and London: W. B. Saunders Co., 1916. Cloth, $6.00.

The Diagnosis and Treatment of Heart Disease. Practical Points for Students and Practitioners. By E. M. Brockbank, M.D. (Vict.), F.R.C.P.; Honorable Physician, Royal Infirmary, Manchester; Clinical Lecturer on Diseases of the Heart, Dean of Clinical Instruction, University of Manchester. Second Edition. 120 pages. Illustrated. New York: Paul B. Hoeber, 1916. Cloth, $1.25.

SOUTHERN MEDICAL NEWS

ALABAMA

At Birmingham, every effort is being made to inaugurate such a public health system that a repetition of the recent typhoid epidemic will be impossible. Dr. Carroll Fox, of the United States Public Health Service, has made an exhaustive study of the sanitary conditions in Birmingham and Jefferson County and has recommended plans for reorganizing the health departments of Birmingham and Jefferson County. The plan calls for an annual appropriation of $30,000.00 from Jefferson County and $45,000.00 from the City of

Birmingham. It is believed that by co-operative effort of the public with the physicians that the system advised by Dr. Fox will be inaugurated.

At Birmingham, during the recent sanitary inspection of the City, many arrests were made and fines imposed upon those found to be disregarding the sanitary laws.

At Alabama City, according to the report of Dr. E. T. Camp, County Health Officer, very insanitary conditions prevail, and attempts are being made to remedy the conditions.

The State Health Department is making an effort to have all the vital statistics sent in compliance with the law and those delinquent in this regard will be summoned before the grand jury.

At Oneonta, on July 27, a large picnic was given by the citizens in honor of Dr. D. S. Moore's birthday. A number of talks were made by grateful patrons of Dr. Moore for his forty-one years of service to the people of that vicinity.

It has been reported that typhoid fever has appeared among the flood refugees at Orrville.

At Huntsville, the Madison County Anti-Tuberculosis Association has been organized with John J. Jones, President, and P. O. Aiken, Secretary. They are obtaining the hearty co-operation of the citizens in their fight against the disease.

At Talladega, it is reported that the typhoid fever and Summer dysentery rate has been cut down appreciably by the installation of the liquid chlorid plant.

Deaths

Dr. A. A. Garret, of Elmore, died on July 22 at the age of 50 years.

ARKANSAS

At Little Rock, Dr. J. P. Runyan has received the appointment of District and Hospital Surgeon for the Rock Island lines.

At Texarkana, due to a rigid enforcement of the sanitary laws, it is reported that the sanitary conditions are much more favorable than formerly.

At Sulphur Springs, the continued illness of Dr. A. G. Thompson is reported.

At Hope, five cases of smallpox were discovered recently and measures were immediately instituted looking toward the prevention of its spread.

Deaths

Dr. W. W. Rambo, a pioneer physician of Ozark, died at his home at White Oak, near that City, at the age of 63 years.

DISTRICT OF COLUMBIA

At Washington, on May 9 to 12, the National Association for the Study and Prevention of Tuberculosis was in session. Dr. Edwin Baldwin, of Saranac Lake, N. Y., was elected President for the ensuing year; Vice Presidents elected were Dr. Watson S. Rankin, of Raleigh, N. C., and Dr. James A. Miller, New York.

At Washington, on October 16, the first examinations will be conducted by the National Board of Medical Examiners. The regular examination fee will not be charged, but only the nominal fee of $5.00.

According to a decision handed down by the United States Court recently, novocain, being a synthetic preparation and not a derivative or compound of opium or coca leaves, does not come under the jurisdiction of the Harrison Anti-Narcotic Law.

At a recent examination Dr. James A. Halpin was appointed Assistant Surgeon in the Medical Reserve Corps of the United States Navy.

At Washington, thirty physician and lawyer friends of Dr. Bernard Gleuck were hosts at a dinner given in his honor on July 11. The occasion of the dinner was the appointment of Dr. Gleuck as Alienist to the New York State Prison at Sing Sing.

At Washington, D. C., May 16, there convened the annual meeting of the State and Provincial Boards of Health of North America.

The next examinations for appointment to the Medical Corps of the Navy will be held at Washington, D. C.; Boston, Mass.; New York City, N. Y.; Philadelphia, Pa.; Norfolk, Va.; Charleston, S. C.; Great Lakes (Chicago), Ill.; Mare Island, Cal., and Puget Sound, Wash., on October 23, 1916. Full information as to the nature of the examinations and the requirements may be had by application to Surgeon-General W. C. Braisted, Navy Department, Washington.

Deaths

Dr. Francis J. Woodman, of Washington, died at his home in that city on July 28. He was Chief Medical Examiner in the Pension Office.

Dr. R. G. Witherspoon died in Washington on June 9.

Dr. Ernest F. King, of Washington, died on June 8.

FLORIDA

At Tampa, Ybor and West Tampa, a vigorous campaign is being carried on in an effort to control the spread of tuberculosis in that community.

At Jacksonville, the good work of Dr. Charles E. Terry has been recognized, as evidenced by his appointment as Editor of the Community Health Department of the Delineator magazine.

At Jacksonville, all incoming trains are being inspected and every attempt being made to keep the City free of infantile paralysis.

Dr. A. T. Cuzner, of Gilmore, near Jacksonville, suggests that a home for aged physicians be founded, and has offered to donate the necessary land for this purpose.

After a tour of inspection by the State Health Officer, it was reported that Pass-A-Grille more nearly carried out the spirit of the sanitary laws than any other locality visited.

Dr. Ralph N. Greene, Chief Physician to the Florida Hospital for the Insane, has resigned to accept a commission as Surgeon in the Florida National Guard. When the Florida troops are no longer needed for service on the Mexican border, Dr. Greene will move to Jacksonville to practice the specialty of mental and nervous diseases.

Dr. A. E. Conter, for some years Assistant Physician for the Florida Hospital for the Insane, has

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STERILE CONTAINERS WITH COMPLETE INSTRUCTIONS FOR COLLECTING ALL SPECIMENS SENT GRATIS UPON REQUEST

(Continued from page 852)

been appointed to succeed Dr. Ralph N. Green, resigned, as head of that institution.

At Pensacola some citizens are attempting to stimulate interest in founding an adequate health department for that City.

At Tampa, an effort is being made to establish a general clinic in connection with the tuberculosis clinic recently instituted in that City.

Dr. Robert Lawson Kennedy has recently moved from Havana to Bascom.

GEORGIA

A bill is pending in the Georgia Legislature, which, if made into a law, will require two years of college work of those who expect to practice medicine in that State.

At Augusta, the health authorities are seeking the full co-operation of the public in their anti-malarial work.

At Atlanta, vaccination and other anti-typhoid measures are being urged by the authorities.

At Savannah, Dr. J. D. Ridlon and Dr. Edward Francis, of the United States Marine Hospital, have proceeded to New York under orders to assist in the fight against infantile paralysis.

Assistant Surgeon W. H. Slaughter, of the U. S. Public Health Service, was in Atlanta recently on duty in regard to the studies of rural sanitation.

The physicians of the fourteen counties included in the Twelfth District Medical Society held their annual session at Jay Bird Springs on July 19. Officers for the ensuing year are: President, C. R. Riner; First Vice President, O. E. New; Second Vice President, J. K. Maloy.

At Savannah, the citizens are demanding a more rigid enforcement of the anti-weed ordinance.

Dr. H. F. Harris, of the State Board of Health, is planning to devote his time to the study of pellagra, and he expects to go to Italy for that purpose.

The members of the Eleventh District Medical Society have entered formal protest against the present tendency to give the credit of the discovery of ether as an anesthetic to W. T. G. Morton, of Massachusetts, because ether was first used as an anesthetic by Dr. Crawford Long, of Georgia.

At Savannah, the official reports show a marked improvement in the general health of the City and a great decrease in the death rate.

Thirteen dairymen in and around Atlanta have been arrested charged with selling impure milk.

Deaths

Dr. William Lovett, Norman Park, died at his home on July 21 at the age of 34 years.

Dr. Price E. Murray, of Atlanta, aged 63 years, died on July 20 at his home in that City.

Dr. J. S. Wood, of Irwinton, died on July 20 at his home in that City.

Dr. Jas. G. Griffeth, formerly of Danielsville, died in Atlanta on July 29.

Dr. J. T. Longino, of Fairburn, died on July 19 from nephritis at the age of 47 years.

Dr. T. P. Reville died in Folkstown on June 20. He was 56 years of age and a practitioner of Charlton County.

KENTUCKY

The annual meeting of the Kentucky Medical Society has been postponed from September 18 to October 18 and 20.

Bids have been let for the erection of the service building of the Fayette County Tuberculosis Sanitarium.

At Georgetown, on July 28, at a meeting of the Board of Health, a general "clean up" order was issued to the proper authorities.

Dr. S. M. Lowry, of Oak Grove, aged 78 years, sustained a fractured hip by being jerked down by a horse at his home near that place.

At Louisville, County Health Officer Dr. J. I. Whittenburg is making every effort to prevent the spread of disease, especially malaria and infantile paralysis.

At Winchester, Dr. I. H. Brown, Health Officer, has rescinded the order that all schools, parks and picture shows should be closed to children under 15 years of age.

Dr. J. R. Paine, a prominent Christian County Physician, suffered a fractured hip when his buggy was turned over on July 6.

Deaths

Dr. George B. Righter, of Cynthiana, Harrison County, died at his home there on July 25. He was for many years a resident of Ruddles Mills.

LOUISIANA

At New Orleans, the historic French Opera House has been given to Tulane University.

At New Orleans, Dr. C. C. Bass, Professor of Experimental Medicine in Tulane Medical School, has been called to New York to assist in the fight against infantile paralysis.

At New Orleans, as an evidence of appreciation for the 25 years of service of Dr. Arthur Weber as Physician to the Fireman's Charitable and Benevolent Association, he was recently presented a silver service set by its members.

The new health car of the Louisiana State Board of Health, under the direction of Dr. Dowling, is fully equipped for doing any bacteriological work and is also equipped with a small automobile, which is sent out at the different stops to gather water and milk for analysis.

At Bogolusa, the Great Southern Lumber Company has transformed an eight-room boarding house into a hospital for the study and treatment of pellagra.

At New Orleans, the Negroes are said to be actively co-operating with the authorities in their crusade against tuberculosis.

At New Orleans, due to the bad odors caused by the By-Products Reclamation Plant, steps have been taken by the health authorities looking toward the closure of that plant.

At New Orleans, Dr. Otis A. Briggs sustained a fracture of the leg recently when his crutch slipped and he fell to the sidewalk.

At New Orleans, all children at the age regarded as susceptible to infantile paralysis, if

(Continued on page 30)

Straining at Stool

is minimized, and often overcome, by the judicious use of **INTEROL,** which softens the fecal mass, and lubricates it all along the colon and rectum, past the sphincter, without irritating or abrading the mucosa.

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little aches where a hypodermic would be too much, and where the pain is also too much for the patient. In such conditions,

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(Continued from page 28)

coming from New York, are kept under surveillance for 14 days.

Dr. Henry Elfer, of New Orleans, who was permanently injured while alighting from a Dauphin street car on June 8, is suing the New Orleans Railway and Light Company for $20,400.

At New Orleans, City Health Officer O'Reilly has gotten out a circular to educate the people in regard to poliomyelitis.

MARYLAND

At Baltimore, during the examination held from June 20 to 23, there were 64 applicants who received license to practice in the State.

At Baltimore, the Police Department is co-operating with the department of public health in its endeavor to clean up the City.

At Baltimore, the Union Protestant Infirmary has been granted the right to build a new infirmary at the corner of Calvert and Thirty-third streets.

At Baltimore, it is reported that Dr. William C. Gorgas will be accompanied on his expedition against yellow fever in South America by Dr. H. R. Carter, Superintendent of the United States Marine Hospital in that City.

Dr. N. M. Keith, of Baltimore, is serving with the Harvard unit in France. He was formerly a member of the Brady Urological staff at Johns Hopkins Hospital.

At Baltimore, the Baltimore Roentgenological Society held its first annual dinner at the Country Club on June 23.

An automobile educational campaign is being carried out through the State this Summer by the Maryland Tuberculosis Association.

Due to the fact that during the following year Dr. Howard A. Kelly will devote all of his time to research work on radium, he has severed his connection with the Johns Hopkins Hospital and his classes will be instructed by Dr. Thomas S. Cullen.

Deaths

Dr. William Simon, of Baltimore, an eminent chemist, died at his cottage at Eaglemere, Pa., on July 20.

Dr. Jacob H. Hartman, an eye, ear, nose and throat specialist of Baltimore, died at the Mercy Hospital on July 28 at the age of 68 years.

Dr. John E. Page, Surgeon of the United States Navy (retired), died May 28. He was 49 years old.

Dr. George H. Carpenter, age 73 years, died at Cumberland on May 24.

Dr. John F. Hanifin, age 30 years, died on May 7 at Saranac Lake, N. Y.

MISSISSIPPI

According to the June report of the Department of Public Health, there is a great increase over last year in the cases of typhoid and malaria, but a decided decrease is shown in tuberculosis and pellagra.

At Yazoo City, according to a ruling of the City Council, physicians can be arrested for speeding even when going to the relief of a very sick patient.

At Monticello, Dr. J. P. Conn has been appointed a member of the Board of Trustees of the State Charity Hospital.

It has been ruled in a recent case that the Board of Health has not the power to remove a health officer unless he has been indicted and convicted of an offense.

At Meridian, Mr. A. J. Lyon is having plans drawn for the erection of a new unit for the tuberculosis hospital.

Deaths

Dr. Robert Benjamin Chisholm, of Summit, died on July 16 at the age of 63 years.

MISSOURI

Among the members of the Executive Committee appointed to draft a workmen's compensation law for Missouri is Dr. R. M. Funkhouser, of St. Louis, who will represent the State Medical Association.

At St. Louis, a very propitious start has been made toward the collection of the $500,000 required to make the Washington University the recipient of a million dollar donation by the Rockefeller Foundation by the subscribing of $166,000 each by Mr. Edward Mallinkrodt and Mr. John T. Milliken.

At St. Louis examinations for license to practice in the State were held at Washington University on June 12-14.

At St. Louis, on June 3, an addition to the library and a portrait of Dr. Jesse S. Meyer were presented by his friends to the St. Louis University Medical School as a memorial of his graduation from that institution twenty years ago.

At Kirksville, Dr. A. L. Canbrie, of Atlanta, presided over the North Missouri Medical Association in its annual meeting on June 14.

Dr. Fred T. Murphy, for some months connected with the American Ambulance in France, has returned to St. Louis, where he is Professor of Surgery at Washington University.

Deaths

Dr. Thomas Irwin, Moberly, died at his home in that City on July 5 at the age of 68 years. He was Consulting Surgeon to the Wabash System and Local Surgeon to the Missouri, Kansas and Texas Railway.

Dr. Charles Hamilton Hughes, St. Louis, aged 77, President of the Medical College faculties in St. Louis and Professor of Nervous and Mental Diseases, died on July 13.

Dr. H. J. Rowe died at his home in Willow Springs on June 17 at 56 years of age.

Dr. William H. Gibbins, age 65, died at Clinton on May 8.

Dr. Berton H. Wheeler, of Kansas City, died at his home in that City at the age of 44.

Dr. Joseph G. Scott, age 79, died at the home of his son in Princeton on June 24.

Dr. Sovereign G. Popplewell, of Milo, died at the home of his son in Sheldon on July 5. He was a sufferer from carcinoma of the stomach.

(Continued on page 32)

Cooking and Chemistry

The ingredients used in compounding your prescriptions must be pure beyond suspicion. What about the ingredients used in the preparation of your patient's food?

Is the cook careful in the choice of leavening agents?

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BAKING POWDER
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By its uniformity of action and its high leavening power, Royal Baking Powder makes breadstuffs palatable, wholesome and digestible.

Royal Baking Powder Contains No Alum

(Continued from page 30)

NORTH CAROLINA

There were nineteen physicians enrolled for the post-graduate course offered by the Extension Bureau of the University of North Carolina.

Notices are being served all the delinquent physicians demanding that all cases of tuberculosis be reported to the Bureau of Tuberculosis of the State Board of Health within ten days after the discovery of the disease.

The school authorities of the State are very active in their efforts to secure legislation providing for the medical inspection of pupils in the rural schools.

Deaths

Dr. R. A. Whitaker died of cerebral hemorrhage at his home in Kinston on July 18 at the age of 59 years.

OKLAHOMA

At Pawnee, Dr. J. L. Lehew was painfully injured and his car badly damaged when he drove over an embankment recently. Dr. Lehew, worn out with the pressure of work, went to sleep while driving the car and woke to find himself in a smash-up.

In Oklahoma physicians to the number of 4,900 paid the revenue taxes for their right to practice medicine.

The Southwestern Medical Association was in session at Lawton on July 11.

According to a recent ruling of the Attorney General, all Chiropractitioners in the State will have to submit to the examinations given by the State Board of Health.

Deaths

Dr. R. W. Murray, of Welling, died on June 6.

Dr. J. A. Root died recently at his home in Granger.

Dr. Jim Nichols died at his home at Bangs recently from an attack of typhoid.

Dr. Pink Montgomery, of Whitewright, was killed recently when his automobile was struck by a freight train.

Dr. M. L. White, of Austin, was found dead at his camp, Deep Eddy, on June 2.

SOUTH CAROLINA

In the work of exterminating typhoid fever and other preventative diseases in the mill villages of the State, the Government authorities have met with the hearty co-operation of the mill owners and employees.

Capt. Allen J. Jervey, of the Medical Corps of the National Guard, has been promoted to the rank of Major.

The United States Public Health Service is to make a last inspection of the Greenville section, and their report upon the percentage of improvement wrought by their work will be ready by October 1.

South Carolina set aside the week beginning August 1 as tuberculosis week, and a determined effort was inaugurated to prevent the spread of this disease in the State.

Deaths

Dr. Thomas W. Reynolds, of Charleston, died at his home early in July.

TENNESSEE

At Mount Pisgah, on July 29, the Giles County Medical Society was given a barbecue by Drs. A. J. and C. W. Lancaster. The regular monthly meeting of the Society was held under the trees on the lawn at the home of Dr. A. J. Lancaster. Dr. J. B. Wright, of Lynnville, read a paper entitled "Bacillary Dysentery." Dr. John S. Harris, of Minor Hill, presented two cases of pellagra. During the afternoon session addresses were delivered by Dr. W. D. Haggard, of Nashville, on "Cancer" and by Dr. Seale Harris, of Birmingham, Ala., on "Ulcer of the Stomach."

At Chattanooga, in order properly to protect the City against malaria and other infections, Commissioner H. D. Huffaker is proposing an act to be placed before the next Legislature whereby permission may be granted for cutting weeds and grass on non-resident premises.

There were a number of cases of typhoid fever reported in Davidson County and the water of Silver Springs, in Winston County, is under suspicion as a causal factor.

It is reported that the United States Public Health Service officials are meeting with commendable success in their efforts to promote rural sanitation in Obion County.

Dr. E. W. Mitchell has been appointed to succeed Dr. L. E. Ragsdale as Superintendent of the Eastern Hospital for the Insane.

At Memphis, infected milk has been given as the cause of the epidemic of typhoid fever there, which showed a morbidity of 209 cases in July.

Dr. J. W. Jobling, of Vanderbilt University, Nashville, is a member of the board working in New York for the purpose of determining the communicability and virulence of infantile paralysis.

Deaths

Dr. J. H. Lackey, a native of Kentucky, but since 1912 a citizen of Nashville, died suddenly at his home on July 29.

Dr. H. Z. Landis, of Memphis, died at his home in that City at the age of 64 years on July 28.

Dr. A. M. West, age 67 years, died at his home in Memphis on July 29.

TEXAS

At Houston, the following officers were chosen to head the State Medical Association for the ensuing year: Dr. E. H. Cary, of Dallas, for President; for Vice President, Dr. R. Y. Lacy, of Pittsburg; Second Vice President, Dr. Charles R. Johnson, Gainesville; Third Vice President, Dr. W. L. Brown, of El Paso; Dr. Holman Taylor was chosen to serve as Secretary for the third time; Dr. W. L. Allison, of Fort Worth, was re-elected Treasurer. The 1917 convention is to be held at Dallas.

Urgent measures are being employed to check the spread of anthrax among the cattle in the

(Continued on page 34)

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The Quaker Oats Company
Chicago (1413)

(Continued from page 32)

counties of the State where the disease has appeared.

At Fort Worth, the local Board of Health is working for the passage of an ordinance requiring that all garbage cans shall be covered.

The Panhandle Medical Association, which has recently been in session in Wichita Falls, will hold the next convention in Amaillo.

Dr. John Rodman, of Dallas, a native Kentuckian but for thirty-four years a well known physician of Texas, died at his home in Dallas on July 28 at the age of 68 years.

Dr. Charles F. Braden, of El Paso, died in a local hospital July 6.

Dr. Samuel F. Vaughan died at his home in Jonesville on July 7.

Dr. John J. Arnold died on July 19 in his home in that City at the age of 43 years.

VIRGINIA

At Staunton at a recent meeting of the Augusta County Medical Association, the resolution was passed whereby the families of members of the National Guard shall receive free medical attention during the time the guardsmen are in the service.

At Radford, on June 28 and 29, the Southwestern Virginia Medical Association was in session.

Dr. Ennion G. Williams, on July 1, received the reappointment to the position of State Health Commissioner.

At Suffolk, the Southside Virginia Medical Association was convened July 13 by its President, Dr. H. A. Burke, Petersburg.

At a recent meeting of the Virginia State Board of Examiners, 87 physicians were granted licenses to practice in the State.

The vacancy caused on the Board of Health by the death of Dr. O. C. Wright, of Jarratt, was recently filled by the appointment of Dr. W. F. Drewry, of the Central State Hospital, Petersburg.

At Richmond, the Board of Aldermen recently appropriated the amount of $1,998, which is to be used by the Health Commissioners in the effort to prevent the spread of infantile paralysis in the State.

Norfolk County has Dr. Sherwood Dix as its full-time Health Commissioner.

The American School Hygiene Association has selected Dr. N. Thomas Ennet, Medical Director of the Richmond public schools, as Chairman of the Section on Mental Hygiene.

An order has recently been issued by the Health Department for an improvement of the sanitary conditions around Shochoe Creek. The order is to fill up the lots to street level.

At Richmond, there has been a widespread epidemic of pertussis.

Dr. N. H. Henderson, of Newport News, was painfully injured when his automobile overturned near Richmond recently.

Deaths

Dr. J. F. Crane died at his home in Richmond on July 11. He was 69 years old and had held the position of City Physician of Richmond for years.

Dr. Herman G. Tarter died at his former home in Wytheville July 15. He was 31 years old and a citizen of Chilhowie.

WEST VIRGINIA

At Charleston there were assembled, recently health officers from 38 counties to attend a meeting of the State Health Council. A number of interesting papers were read.

At Clarksburg, recently, 49 applicants were examined for certificate of qualification to practice medicine in the State.

The sanitary engineers of the State have just completed a survey of a number of counties and have handed down recommendations for the improvement of the sanitary conditions in several instances.

At Charleston, Dr. J. N. Simpson, Dean of the University College of Medicine, was made Director of the State Chemical Laboratory, and A. G. Cook, of Morgantown, has been appointed State Chemist and Assistant Bacteriologist.

The recent report of the Charlestown Board of Health indicates that the City health is unusually good, there being only 23 cases of infectious disease reported during the past month.

Deaths

Dr. Wm. R. Hudson, a recent graduate of the Medical Department of Johns Hopkins University, while swimming in the Shennandoah River, was drowned in an effort to save two other drowning persons. His home was at Huntington.

Dr. C. J. French, of Huntington, died in Kenova in June.

Dr. B. H. Stillyard died at his home in Wheeling on July 17. He was 69 years old and had practiced medicine for 42 years.

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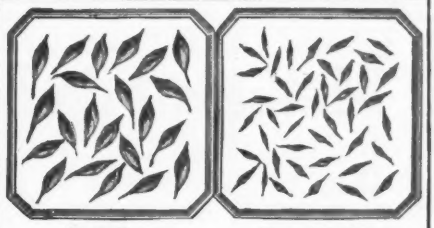

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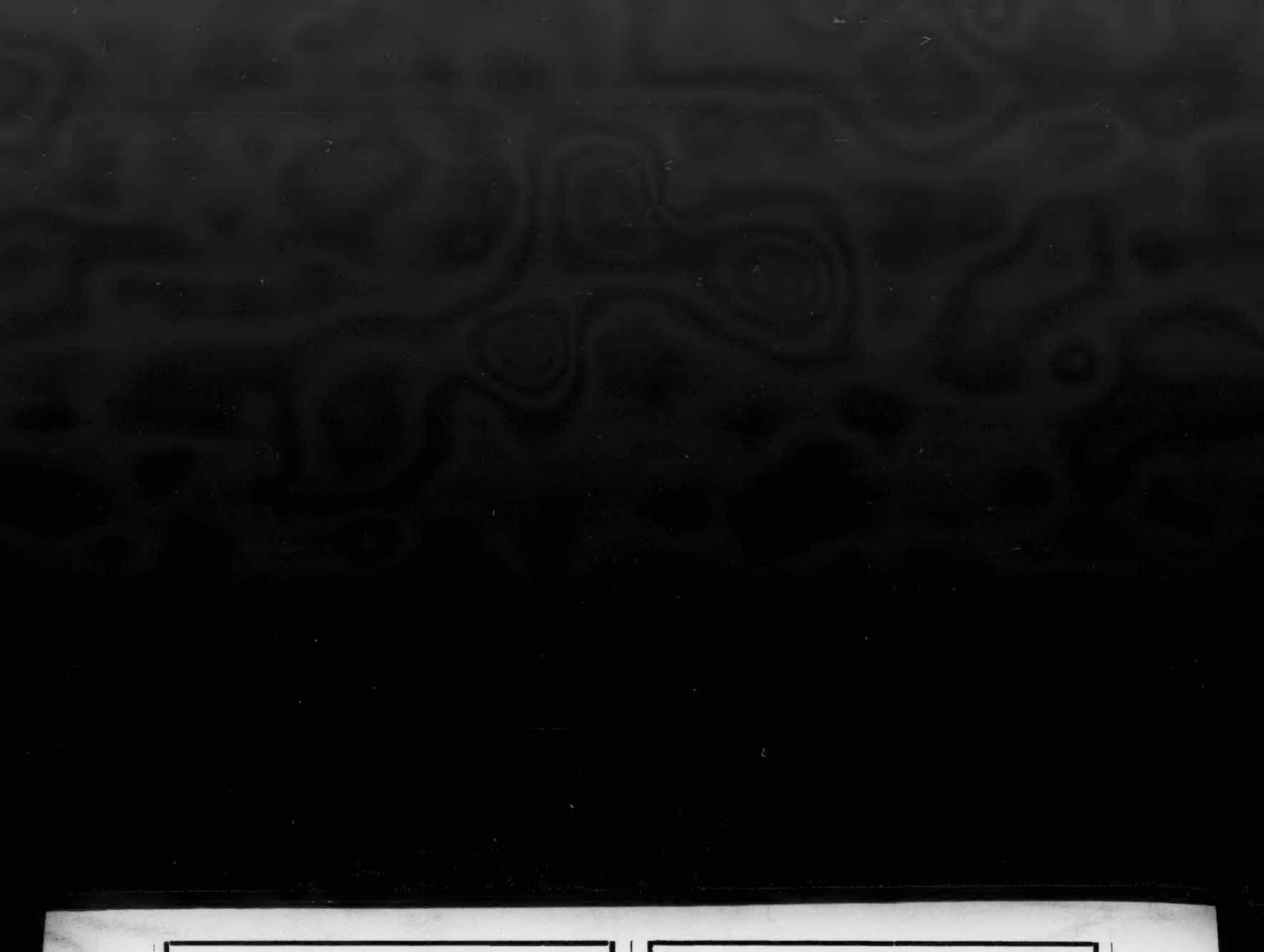

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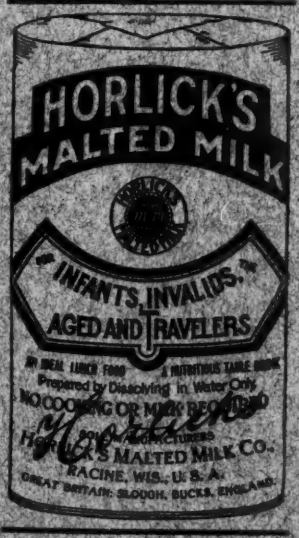

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